EUROPEAN UNION AGENCY FOR RAILWAYS

Moving Europe towards a sustainable and safe railway system without frontiers.

Electronic reservation of seats/berths and electronic production of travel documents - exchange of messages - Annex A2

Telematics TSI - Technical Document - B5 - Annex A2

Version 4.0

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A. Document management

A.1 Document properties

- File name: ERA_TD_B5_A2.docx
- Subject and document type: Telematics TSI - Technical Document - B5 - Annex A2
- Author: ERA
- Version: 4.0

A.2 Change management

Updates to this technical document shall be subject to Change Control Management procedure managed by the Agency pursuant:

- the applicable requirements in the reference TSI
- Art. 23(2) of the Agency Regulation

If necessary, working groups are created in line with Art. 5 of the Agency Regulation.

A.3 Configuration management

A new version of the document will be created if new changes are considered following the Change Control Management Process led by ERA.

More specifically:

- if there is a change in the requirements which influences the implementation
- if information is added to or deleted from the technical document
- adding test cases to the field checking in messages or databases.

Modifications will have to be highlighted, so they can be easily identified.

Disclaimer:

Specific legal references to technical documents and legal acts shall be revised after the enter into force of the Telematics TSI. In some sections this text can be highlighted.

A.4 Availability

The version in force of this document is available on Agency's Gitlab repository. Any printed copy is uncontrolled.

A.5 Application and actors in the scope

Date of entry into force of reference TSI.

This document applies to all the actors in the scope of the reference TSI.

A.6 Document history

Table 1 - Document history

Version	Date	Comments
1.4.5	15.12.2023	New Annex – A2
4.0	10.06.2025	Initial version for Telematics TSI

B. Acronyms, definitions and external references

B.1 Acronyms

Table 2 - Acronyms

Acronym	Full text
API	Application Programming Interface
CAS	Central Administration Service
CCB	Change Control Board
CCM	Change Control Management
CR	Change Request
EC	European Commission
EN	European Norm
ENEE	European Railway Location Database
ERA	European Union Agency for Railways also called “the Agency”
ERADIS	Interoperability and Safety database managed by the European Union Agency for railways
ERATV	European Register of Authorised Types of Vehicles
EVR	European Vehicle Register
EU	European Union
FRS	Functional Requirements Specification
IC	Interoperability Constituent
HCI	Human Computer Interface
IM	Infrastructure Manager
INF	Infrastructure
ILU	Intermodal Loading Unit
ILURD	Intermodal Loading Unit Reference Database
ISO	International Organisation for Standardisation
OC	Organisation Code
OCR	Organisation Code Register
OSJD	Organisation for Co-operation between Railways
PLC	Primary Location Code
RICS	Railway Interchange Coding System
RINF	Register of Infrastructure
RSRD	Rolling Stock Reference Database
RU	Railway Undertaking
SLA	Service Level Agreement
SLC	Subsidiary Location Code
SRM	Stakeholder Relationship Management Tool
TAF	Telematics Applications for Freight

TAP	Telematics Applications for Passenger
TD	Technical Document
TSI	Technical Specification for Interoperability
UIC	International Union of Railways (Union Internationale des Chemins de Fer)
WIMO	Wagon and Intermodal Unit Operating Database
WP	Working Party

B.2 Definitions

Terms contained in this document are defined in the ERA Ontology.

B.3 External references

The referenced documents listed in Table 2 are indispensable for the application of this document:

- For dated references, only the edition cited applies;
- For undated references, if any, the latest edition of the referenced document (including any amendments) applies.

Table 2 Reference documents

ID	Title	Doc ID, Edition	Date	Author/ Publisher
[1]	ERA Technical Document B.11: Layout for electronically issued rail passenger tickets			ERA
[2]	ERA TAP TSI Technical Document B.12: Digital security elements for rail passenger ticketing			
[3]	ISO 4217:2015 - Codes for the representation of currencies and funds, August 2001	-	2015	ISO
[4]	ISO 3166:2020 - Codes for the representation of names of countries and their subdivisions	-	2020	ISO

1 Messages

1.1 General

1.1.1 Foundations

The specification of the xml reservation messages was prepared according to the rules of the xml best practice document of UIC.

- The specification tries to fulfill the following requirements:
- Defining xml messages for reservation according to the best practice standard for xml
- Defining xml messages for reservation that can be converted to/from reservation messages specified in ERA technical document B.5 Annex A1.
- Reuse of type definitions from the UIC xml passenger type catalogue for all data items not specific to reservation.

1.1.2 Name spaces

The reservation specific definitions are located in the namespace http://www.uic-asso.fr/xml/passenger/reservation/01. Note, that the namespace is a virtual address in the UIC web area, that does not necessarily lead to the real specification.

The specification is versioned. The mayor version number is indicated by the last section of the namespace.

1.1.2.1 Name spaces from version 2.0 onwards

All definitions are located in one namespace for passenger services:
http://www.uic.org/xml/passenger/01

The specification is versioned. The mayor version number is indicated by the last section of the namespace.

1.1.3 Character Sets

The specification of the allowed characters in string format for xml messages is broader than the specification in leaflet 918-1. The restriction in chapter **Error! Reference source not found.**) is made due t o the printer capabilities of the applications and is not caused by limitations of the interface (918-1 or xml). Therefore it is defined, that also all string formats in the xml specification are currently restricted to the character table defined in 918-1.

1.1.4 XML specification documents

The specification is provided by schema files (xsd files).

For the convenience of the user generated documentation files are provided additionally in word format, pdf format and html format. These documentation files are generated and do not contain any additional information. The relevant master documents for implementing an interface based on this specification are the schema files only.

The generated document files contain the complete documentation of the imported catalogues, regardless whether a type definition of the catalogue is used or not.

1.1.5 Reservation schema files

The schema files are organized as follows:

Type Definitions:

- uic_reservationsimpletypes.xsd contains all reservation specific simple type definitions.
- uic_reservationcomplextypes.xsd contains all reservation specific complex type definitions

Message Definitions:

- uic_reservationavailrp.xsd
- uic_reservationavailrq.xsd
- uic_reservationbookrq.xsd
- uic_reservationbookrp.xsd
- uic_reservationcancelrq.xsd
- uic_reservationcancelrp.xsd
- uic_reservationpartialcancelrq.xsd
- uic_reservationpartialcancelrp.xsd
- uic_reservationrollbackrq.xsd
- uic_reservationrollbackrp.xsd
- uic_reservationsynchrorq.xsd
- uic_reservationsynchrorp.xsd

Optional, not required in TAP TSI:

- uic_availgbrq.xsd
- uic_availgbrp.xsd
- uic_layoutrq.xsd
- uic_layoutrp.xsd

The following message are not reservation specific and are thus placed in the namespace http://www.uic-asso.fr/xml/passenger/02:

- uic_addpersonaldatarq.xsd
- uic_addpersonaldatarp.xsd
- uic_getstoredpersonaldatarq.xsd
- uic_getstoredpersonaldatarp.xsd
- uic_getsecurityfeaturesrq.xsd
- uic_getsecurityfeaturesrp.xsd

1.1.6 imported schema files

The following schema files are imported:

- passengersimpletypes.xsd
- passengercomplextypes.xsd

The schema files are imported from the namespace http://www.uic-asso.fr/xml/passenger/02.

1.1.7 Additional documentation files

- B.5 xml_schema_files.zip

Implementation of changes

1.1.8 Implementation of changes

New elements and attributes will in general be implemented within two steps. In a first step each system must accept the new elements in received messages. In the second step the elements must be sent and processed by each system.

An implementation of this interface must therefore include mechanisms to support the first step of implementation without software changes.

1.1.9 Implementation of syntax and semantic checks

It is recommended to implement checks on the syntax of messages generally within the interface and implement check the semantics (checks on codes defined in enumeration) in the application, as the error messages generated by the application is more detailed. Therefore, it is recommended to replace enumerations of frequently changing code lists by the basic type before generating code for web services.

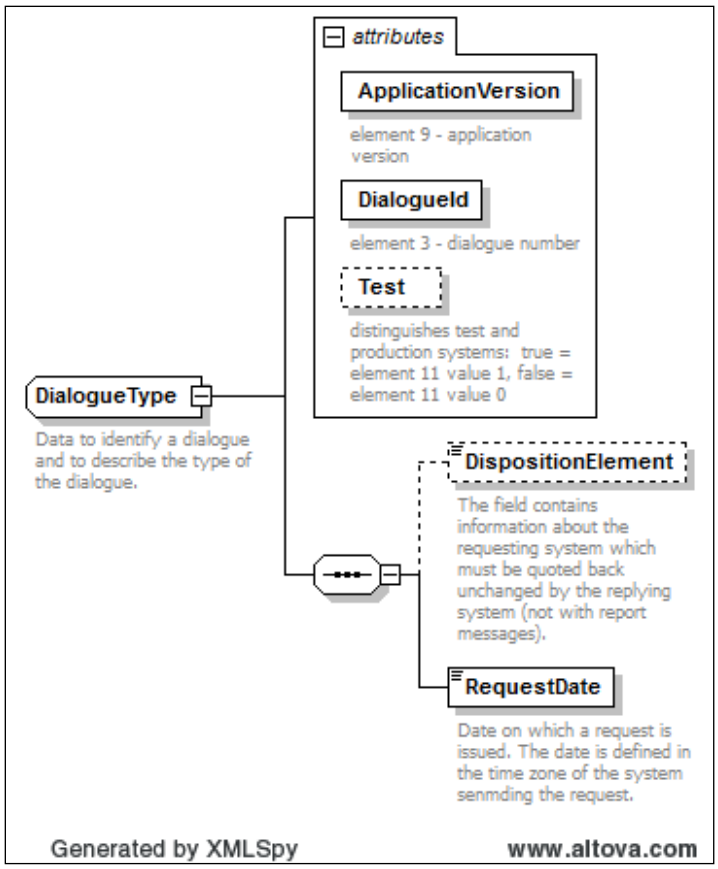
Characters used in the message elements

Description of data structures used in multiple messages.

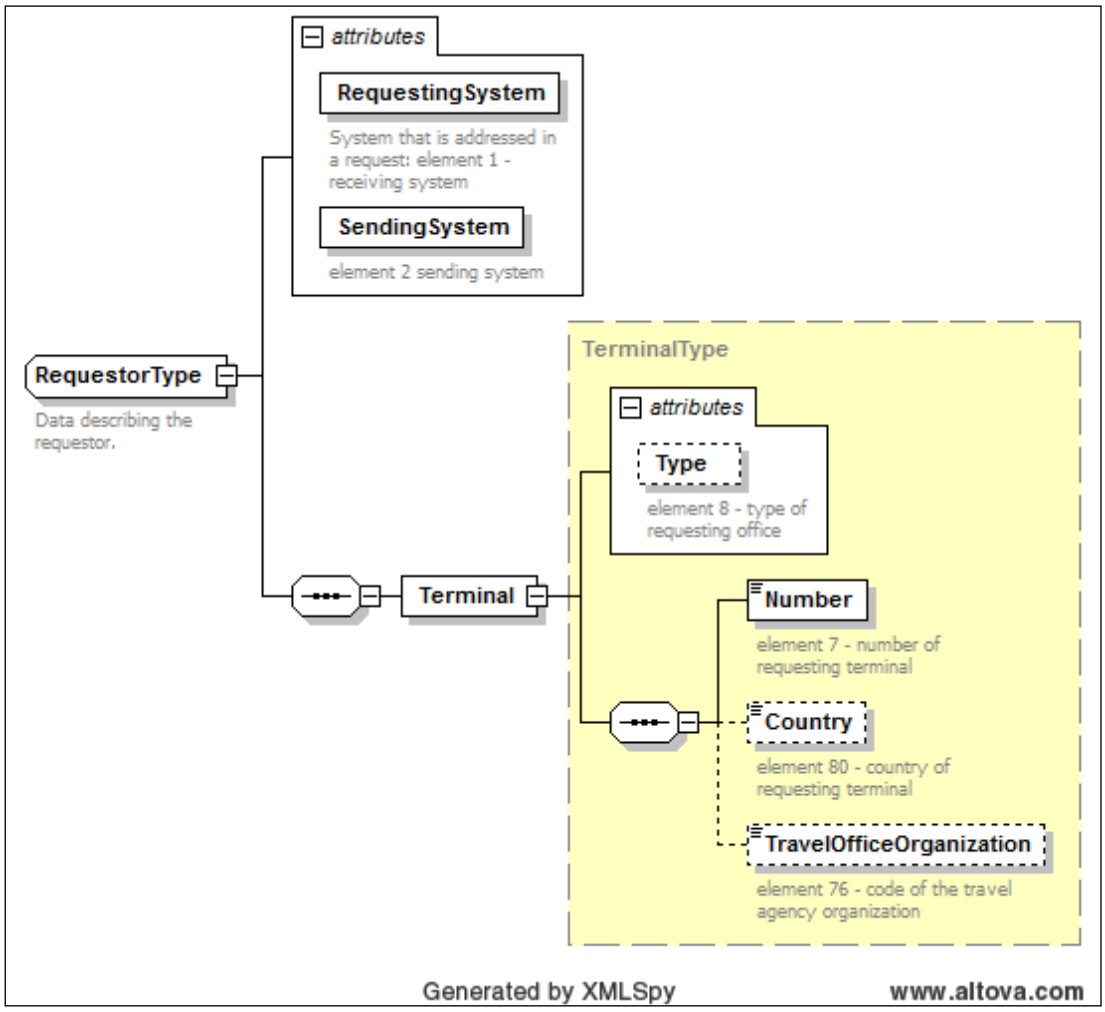
The description of the main data structures displayed here is a documentation generated from the corresponding schema files for the convenience of the reader. The master of the specification is always the schema file itself!

1.1.10 Dialogue

XML data structure of the message dialogue information

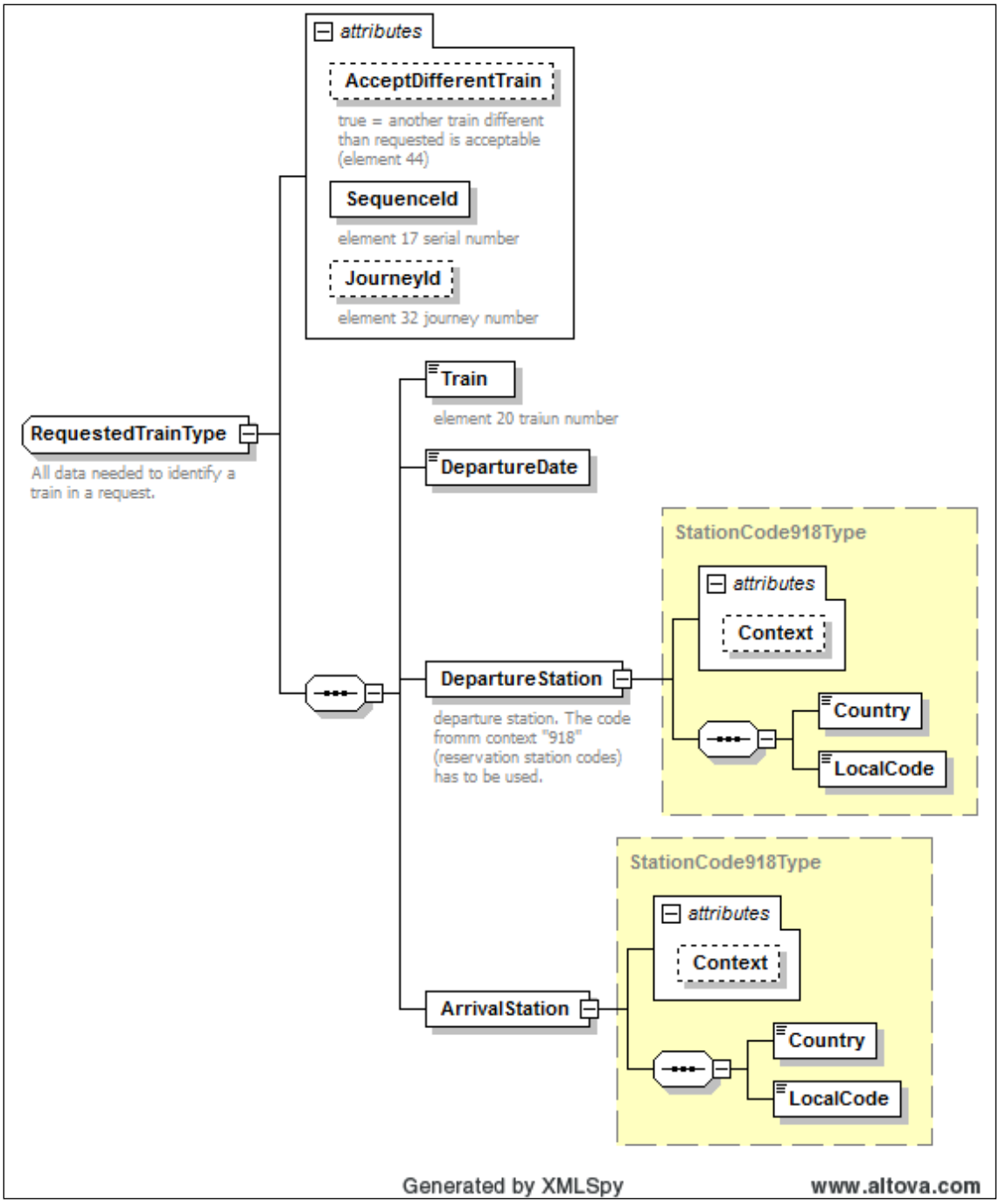


1.1.11 Requestor



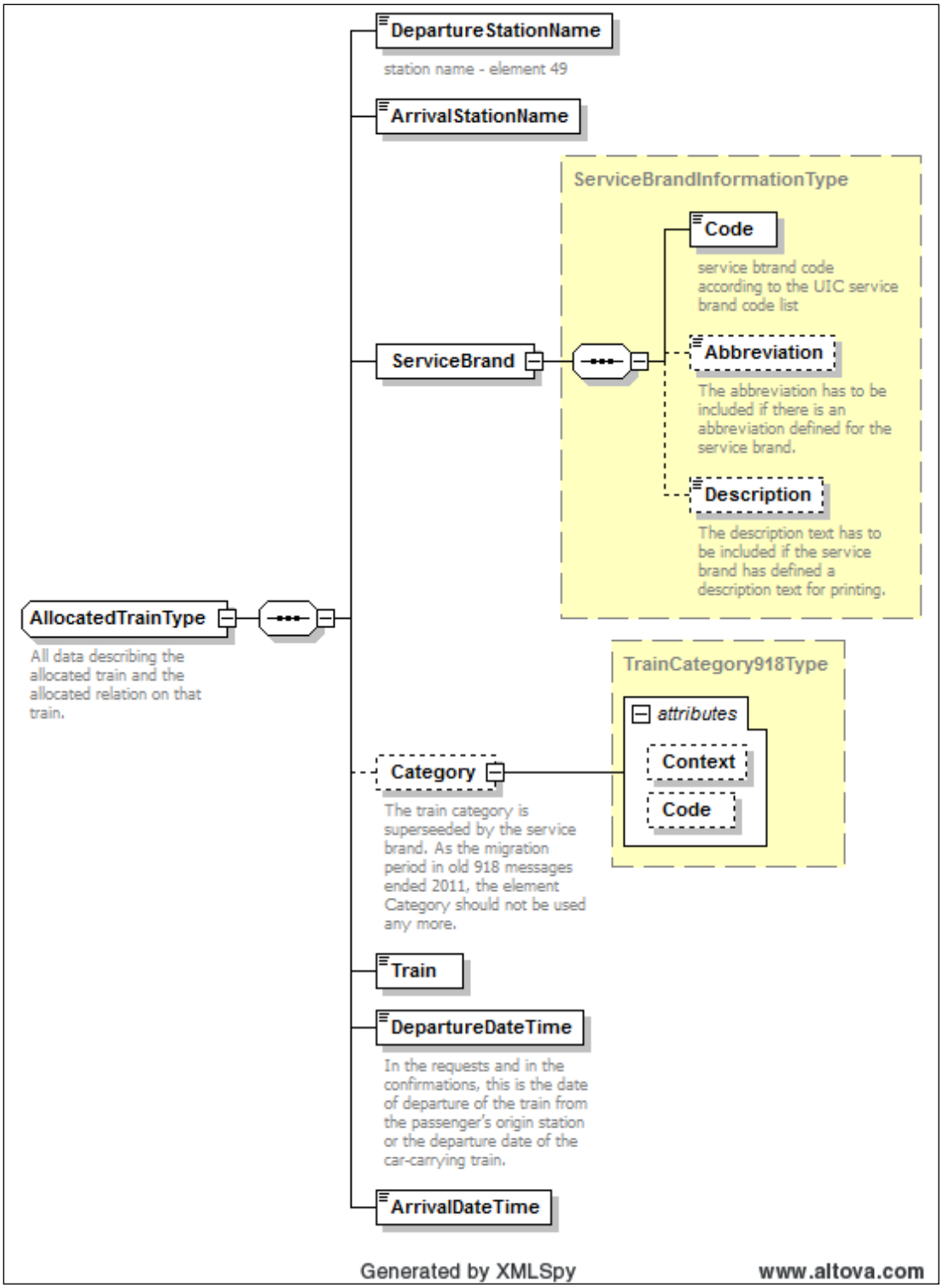
1.1.12 Requested Train

Identification of a train in a request.



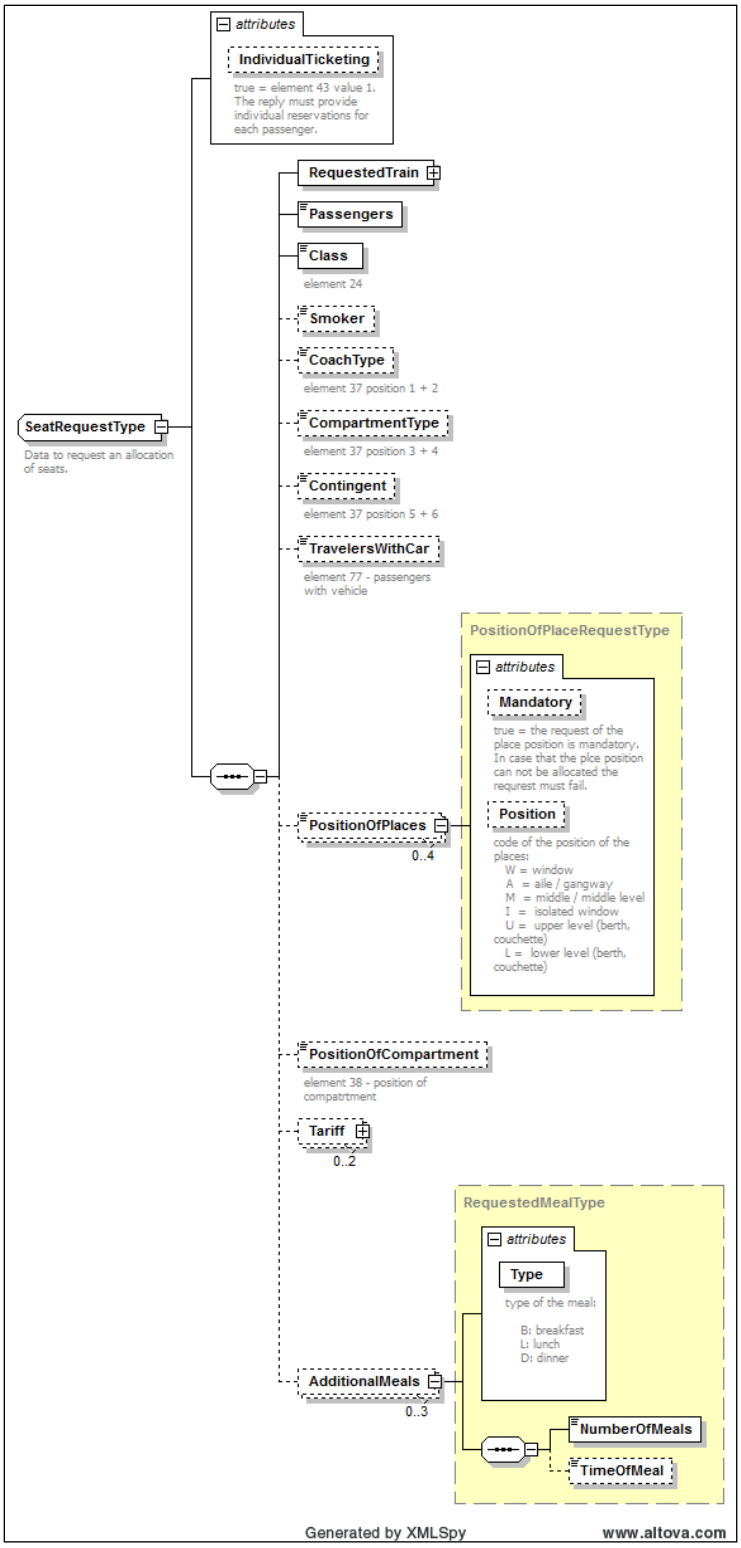
1.1.13 Allocated Train

Description of a train in an allocation:



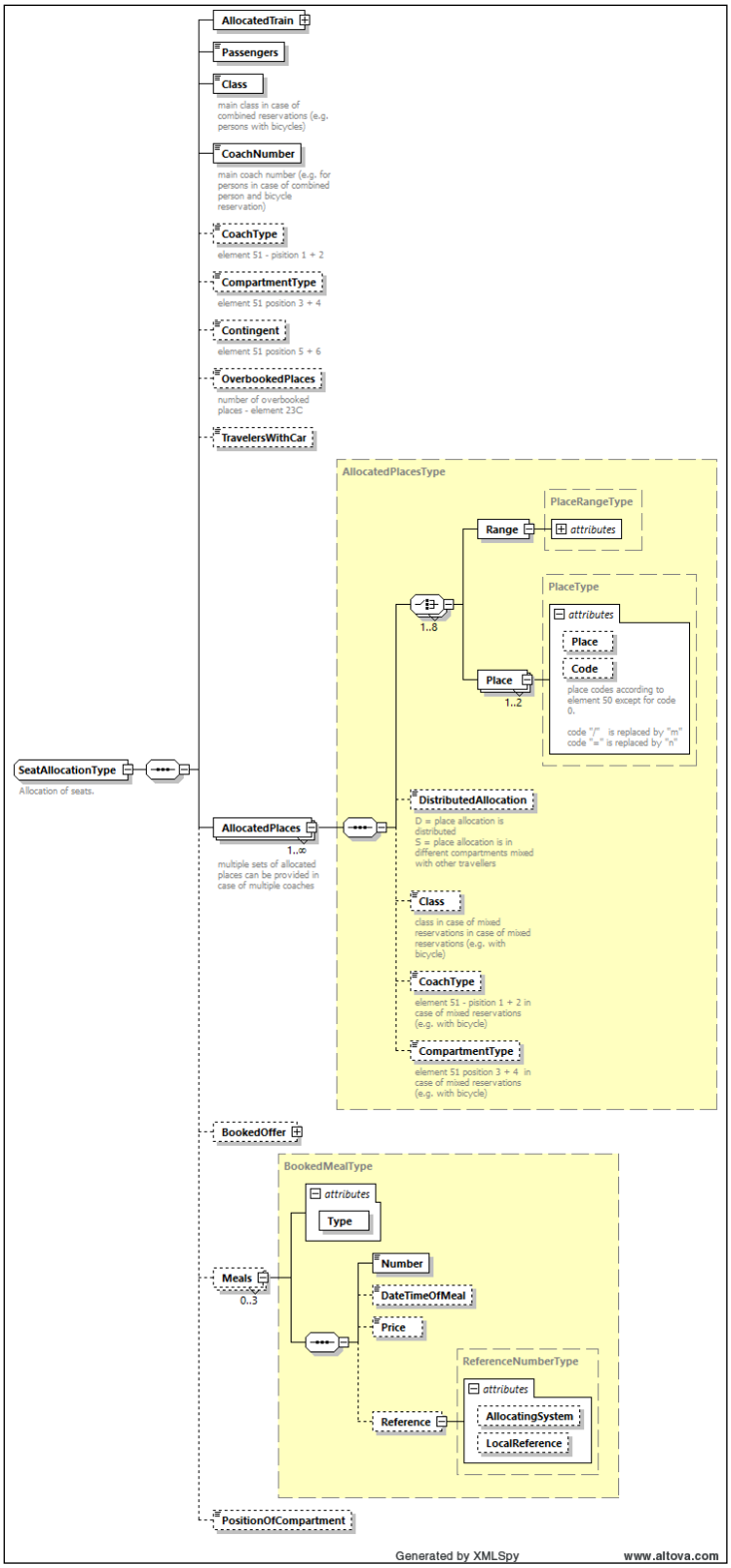
1.1.14 Seat Request

Request parameter for a seat request



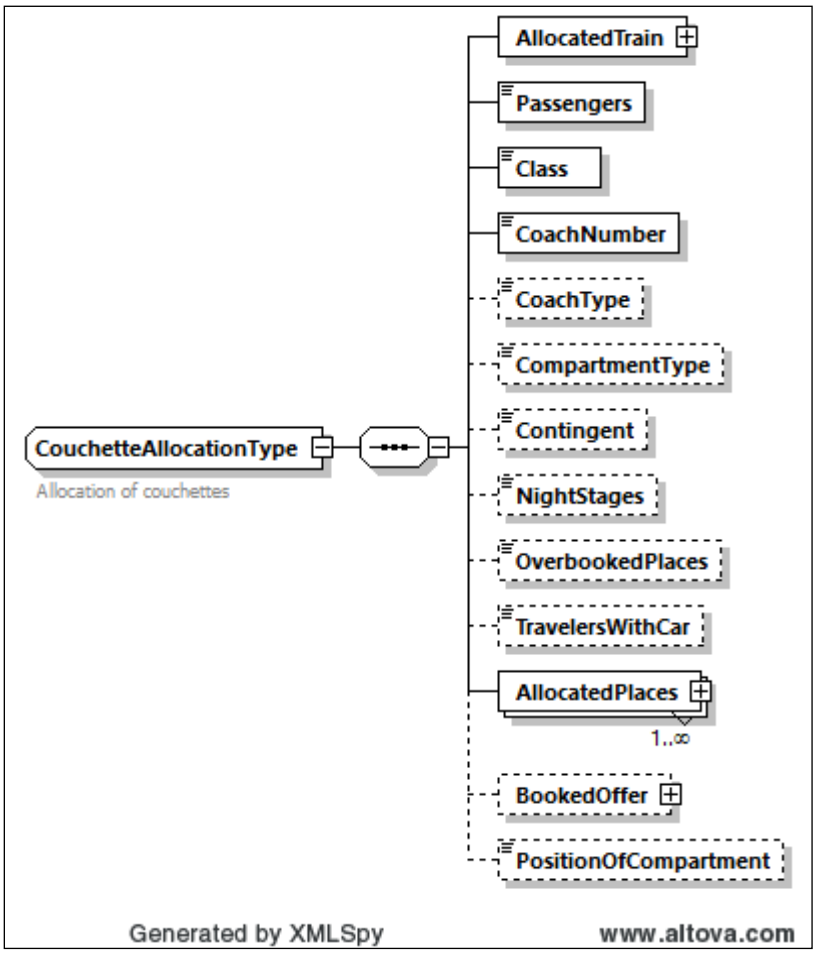
1.1.15 Seat Allocation

Description of allocated seats including allocation details



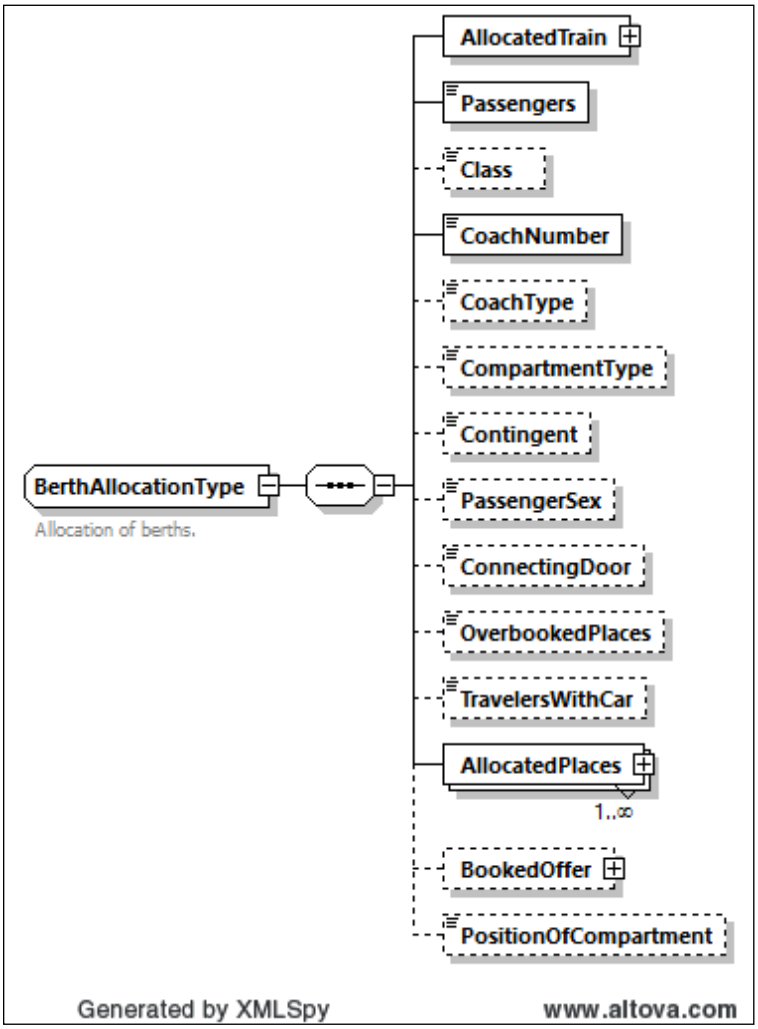
1.1.16 Couchette Allocation

Couchette allocation description:



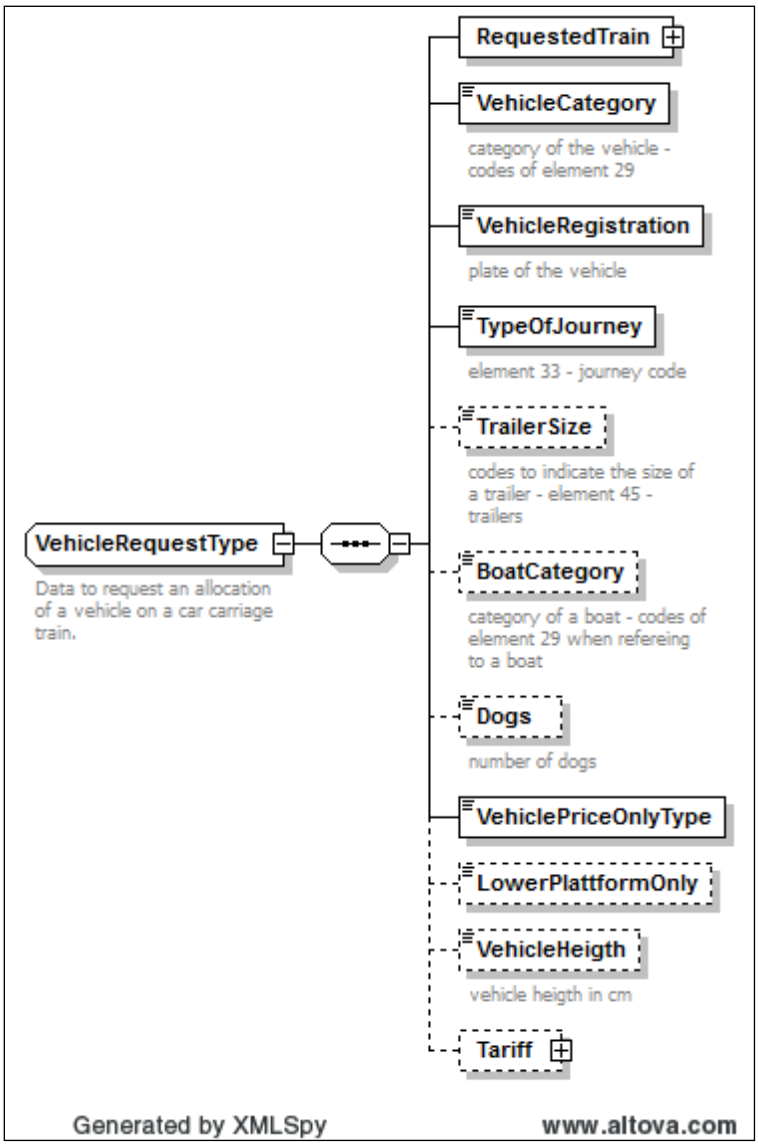
1.1.17 Berth Allocation

Description of berth allocation:



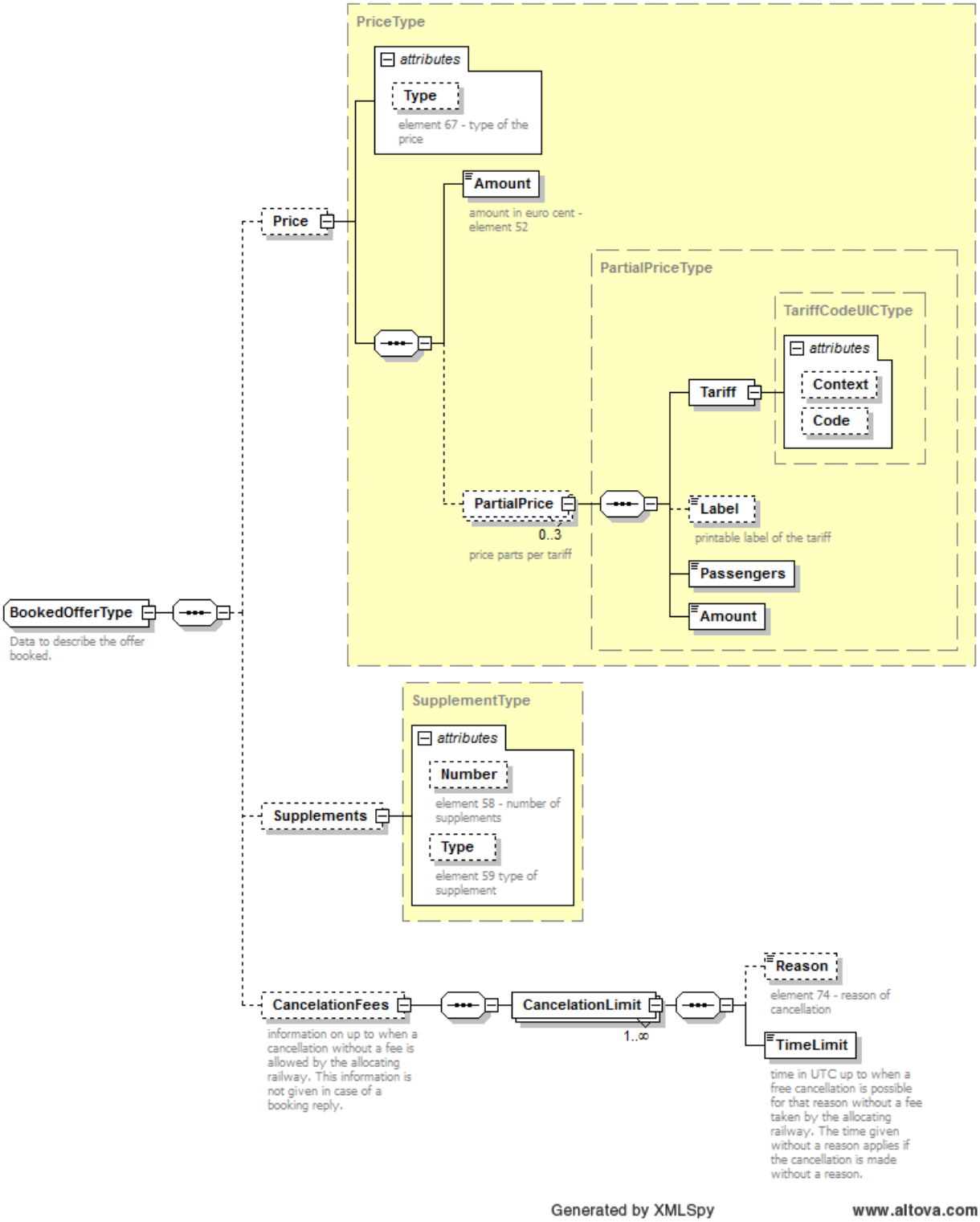
1.1.18 Vehicle Allocation

Description of a vehicle allocation



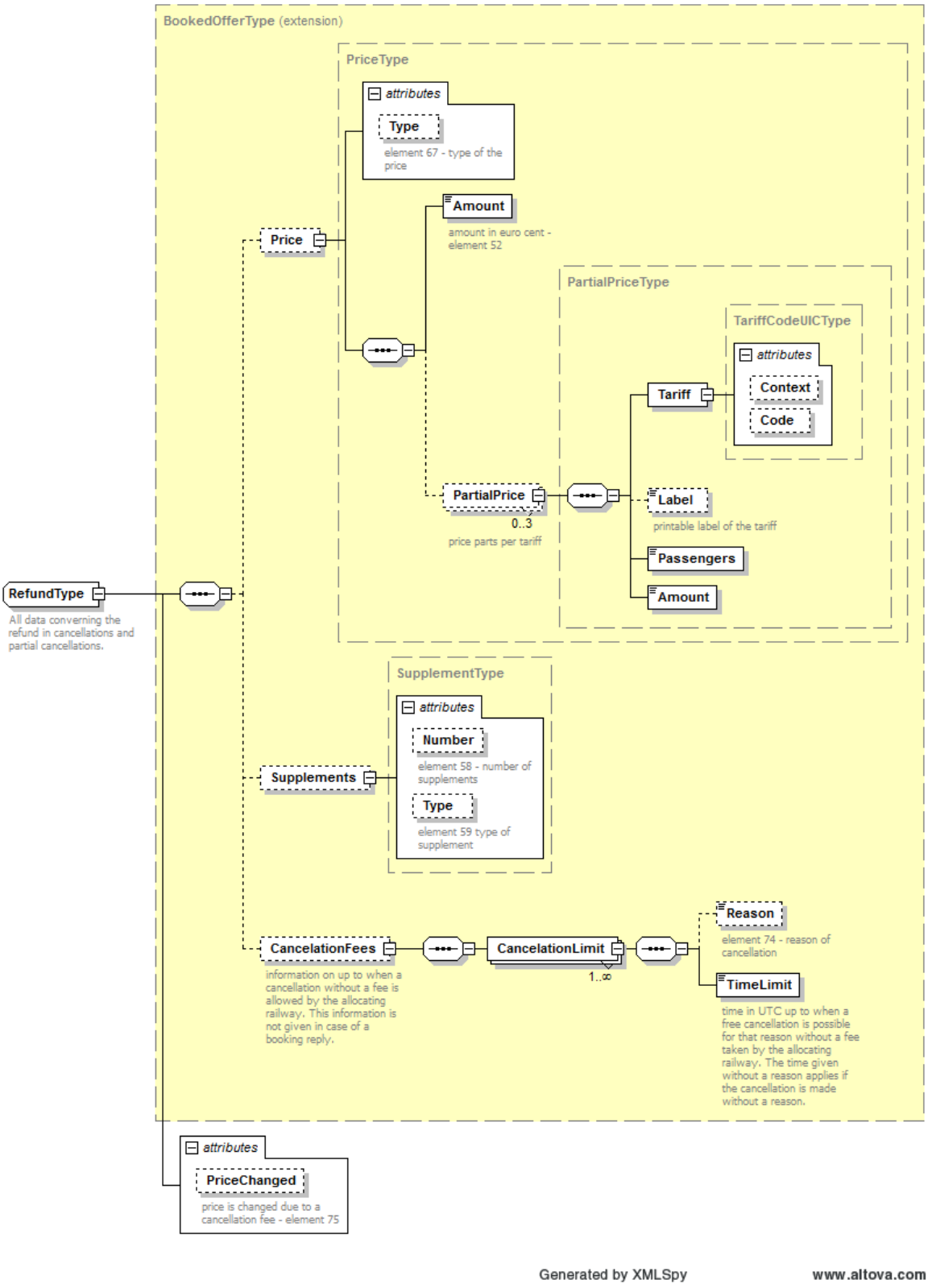
1.1.19 Booked Offer

Data type to describe a booked offer in reservation:



1.1.20 Refund

Data type to describe a refund on a cancellation:



1.1.21 Passenger data

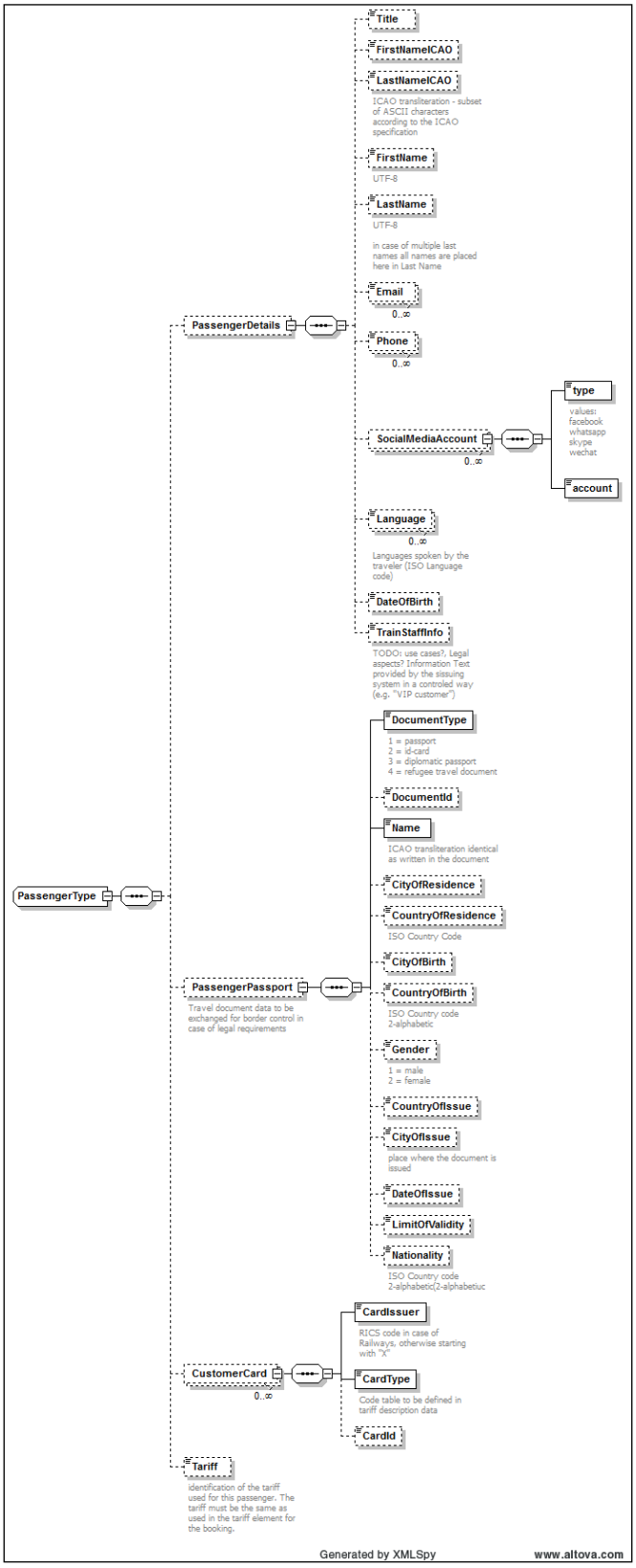
The passenger data tag is used wherever passenger personal data need to be transferred. It provides a data structure for all personal data. The applications have to select the appropriate data elements to be filled depending on the situation where it is used.

As the passenger data tag is used in many scenarios almost all elements are defined as optional to allow the applications to transfer only personal data needed for the use case.

Names have been included in ICOA transliteration (see page **Error! Bookmark not defined.**) without special characters and in UTF-8 format. Systems that are not capable of UTF-8 should use the ICOA transliteration.

Customer cards have been added for future use.

Remark: In case a system works with names according to ICAO Standard only it is sufficient to fill the name in the Tags for ICAO names. The receiving system has to take the name from there in case the UTF-8 encoded name is empty.


PassengerType
PassengerDetails
Title
FirstNameICAO
LastNameICAO
ICAO transliteration - subset of ASCII characters according to the ICAO specification
FirstName
UTF-8
LastName
UTF-8
in case of multiple last names all names are placed here in Last Name
Email
0..∞
Phone
0..∞
SocialMediaAccount
0..∞
type
values:
facebook
whatsapp
skype
wechat
account
Language
0..∞
Languages spoken by the traveler (ISO Language code)
DateOfBirth
TrainStaffInfo
TODO: use cases?, Legal aspects? Information Text provided by the sissuing system in a controled way (e.g. "VIP customer")
PassengerPassport
Travel document data to be exchanged for border control in case of legal requirements
DocumentType
1 = passport
2 = id-card
3 = diplomatic passport
4 = refugee travel document
DocumentId
Name
ICAO transliteration identical as written in the document
CityOfResidence
CountryOfResidence
ISO Country Code
CityOfBirth
CountryOfBirth
ISO Country code 2-alphabetic
Gender
1 = male
2 = female
CountryOfIssue
CityOfIssue
place where the document is issued
DateOfIssue
LimitOfValidity
Nationality
ISO Country code 2-alphabetic(2-alphabetiuc
CustomerCard
0..∞
CardIssuer
RICS code in case of Railways, otherwise starting with "X"
CardType
Code table to be defined in tariff description data
CardId
Tariff
identification of the tariff used for this passenger. The tariff must be the same as used in the tariff element for the booking.
Generated by XMLSpy
www.altova.com

1.1.22 Ticket Security

1.1.22.1 Description of a security features for e-tickets.

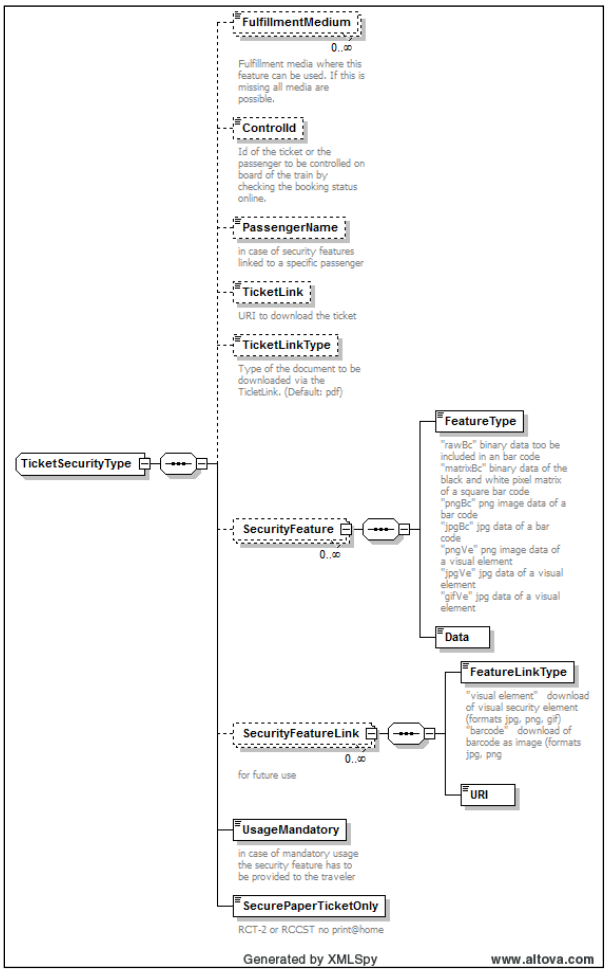
The ticket security tag is used to encode security features or links to security features where ever these data need to be transferred.

A security feature can be linked to a specific passenger (e.g. for individual ticketing) via the passenger name. In this case the EU regulation on data protection for personal data applies.

The data structure can also include data for bar codes. In case these data include personal data the EU regulation of on data protection for personal data applies as well.

The data structure can also include a link to security elements or entire tickets. In case the data that can be accessed via the link include personal data the EU regulation of on data protection for personal data applies also to the data containing the link only. A link (URI) to a ticket containing personal data has to be treated as personal data according to the EU data protection regulation as well.

It is possible to give information on whether the security feature is mandatory of is designed for paper tickets only.

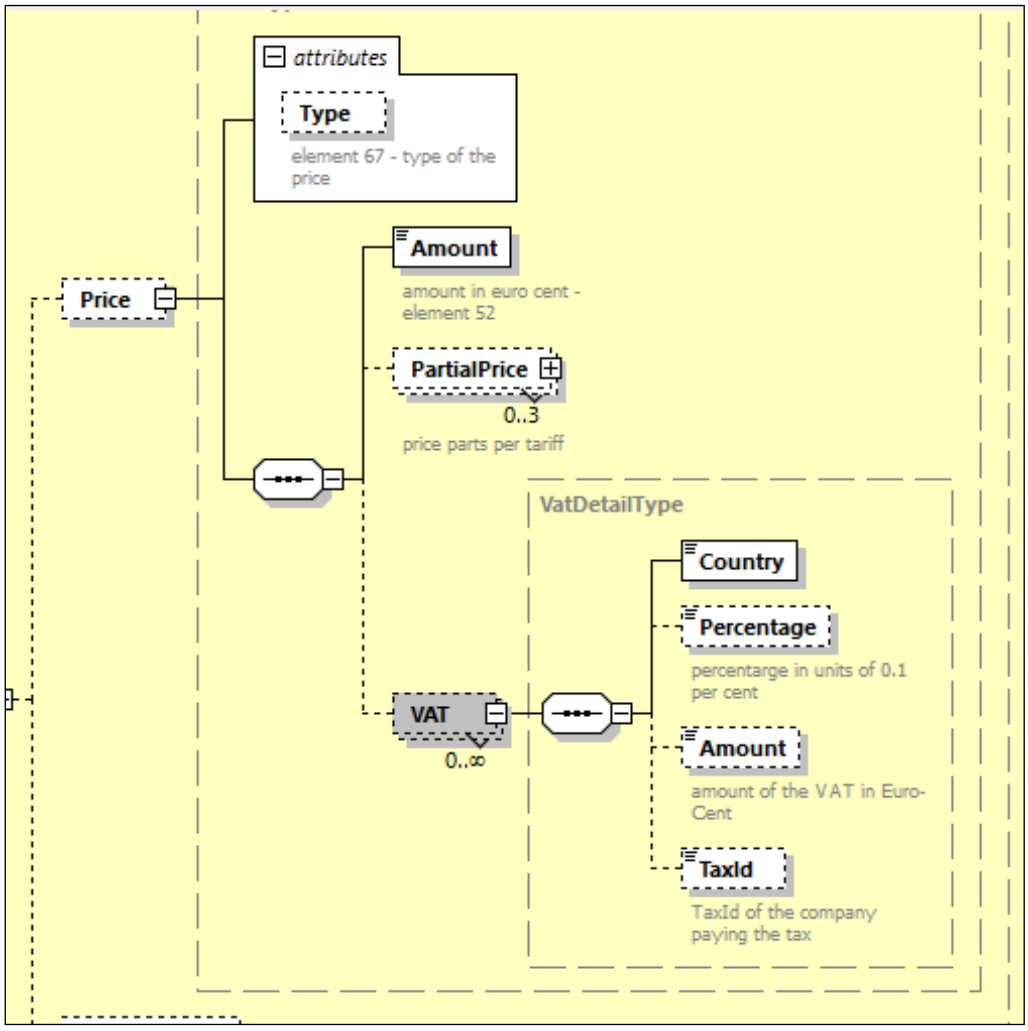


1.1.23 VAT data

The VAT data structure includes a list of VAT details where the taxation country is mandatory. Optionally the Amount of tax and the percentage and the tax id of the company paying the tax can be added. For companies within the EU this is the unique European tax id.

The VAT details can be added to booking confirmations, Confirmations of cancellation and partial cancellations. In case of partial cancellation, the data can be added to the price of the remaining places and to the cancellation fee separately.

The obligation to provide the tax information to the customer depends on the legislation of the country where the ticket is sold and the country where the transport service is delivered.

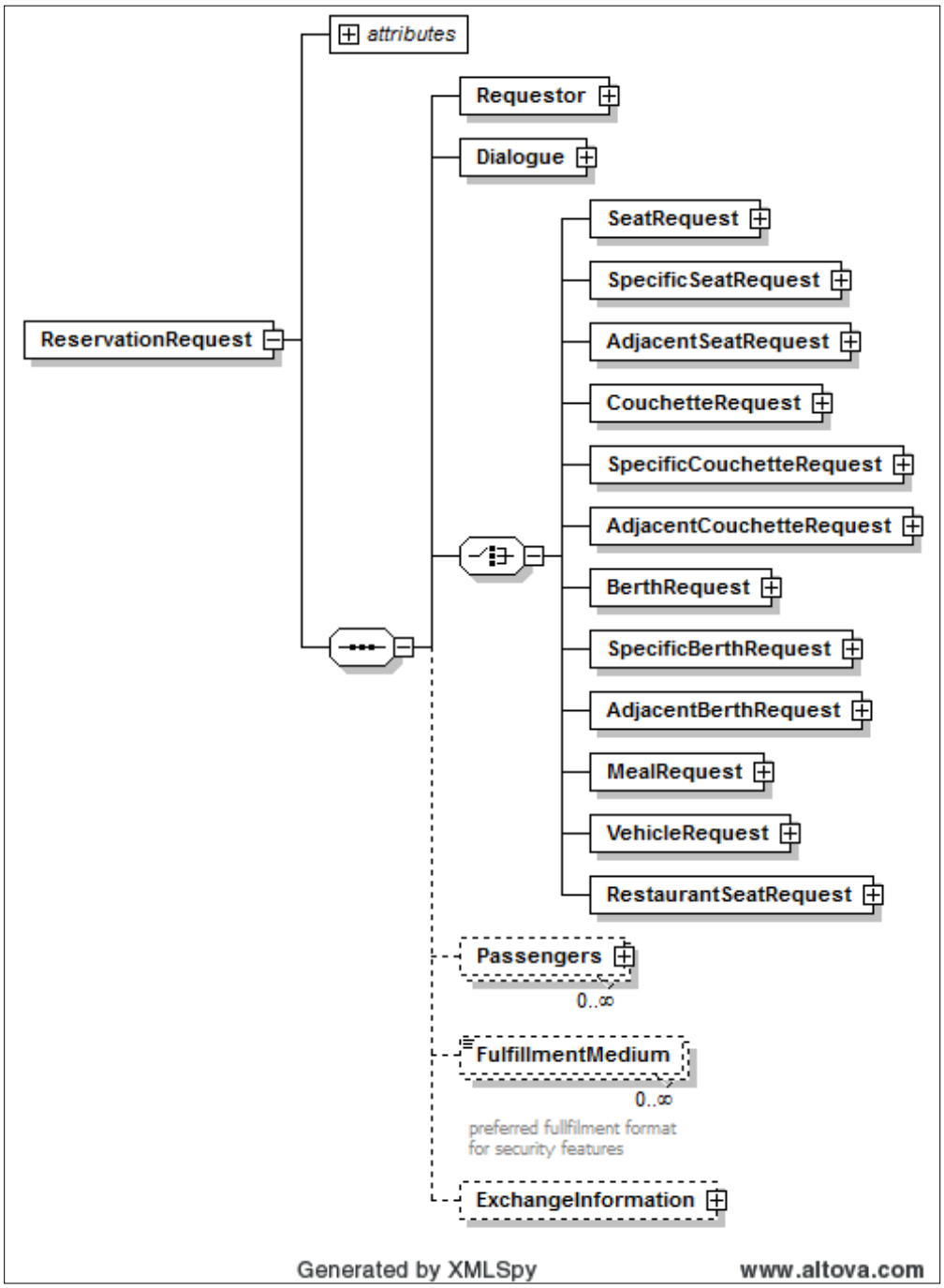


Basic XML Messages

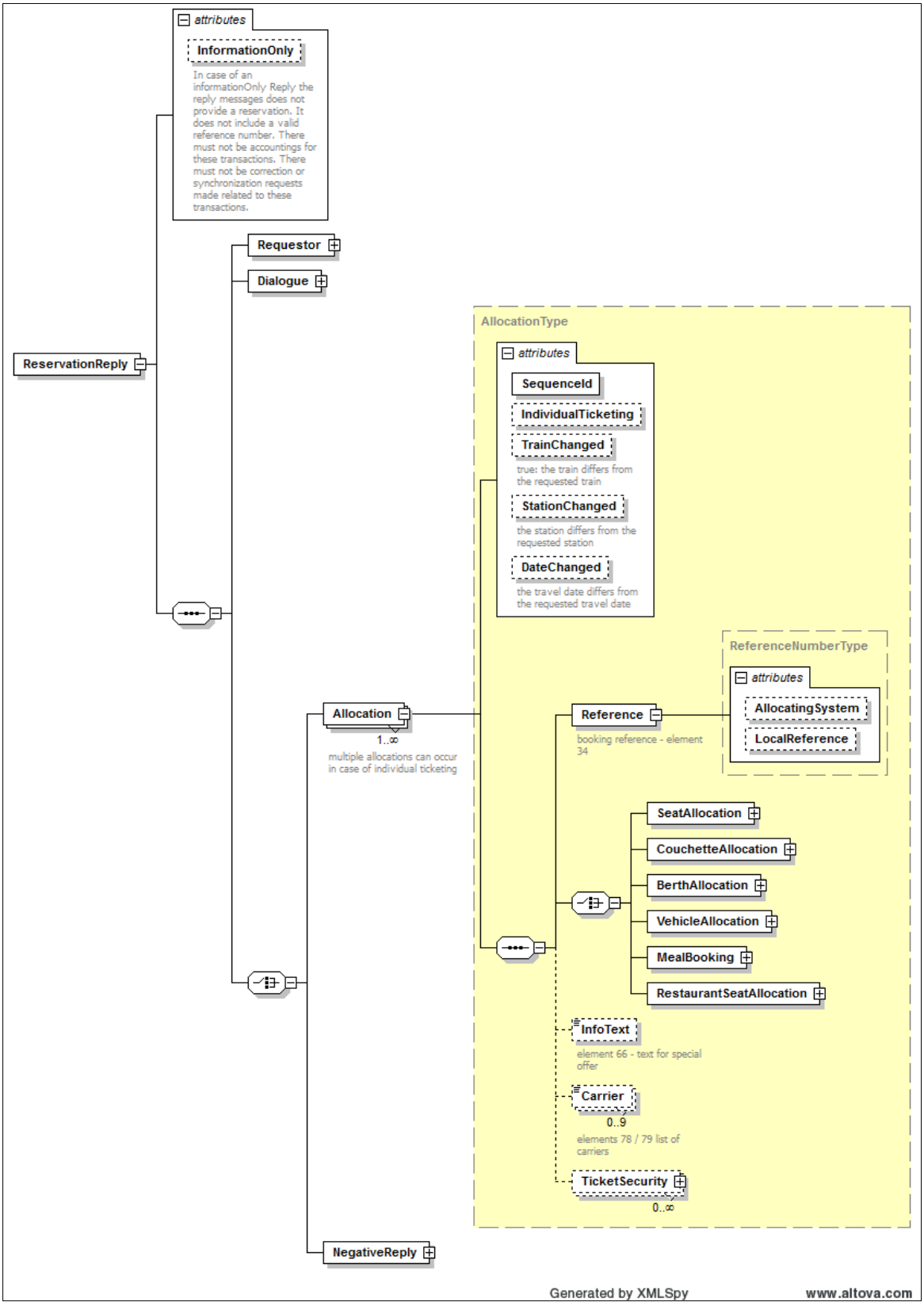
The description of the message structures displayed here is a documentation generated from the corresponding schema files for the convenience of the reader. The master of the specification is always the schema file itself!

1.1.24 Reservation

Request Message:

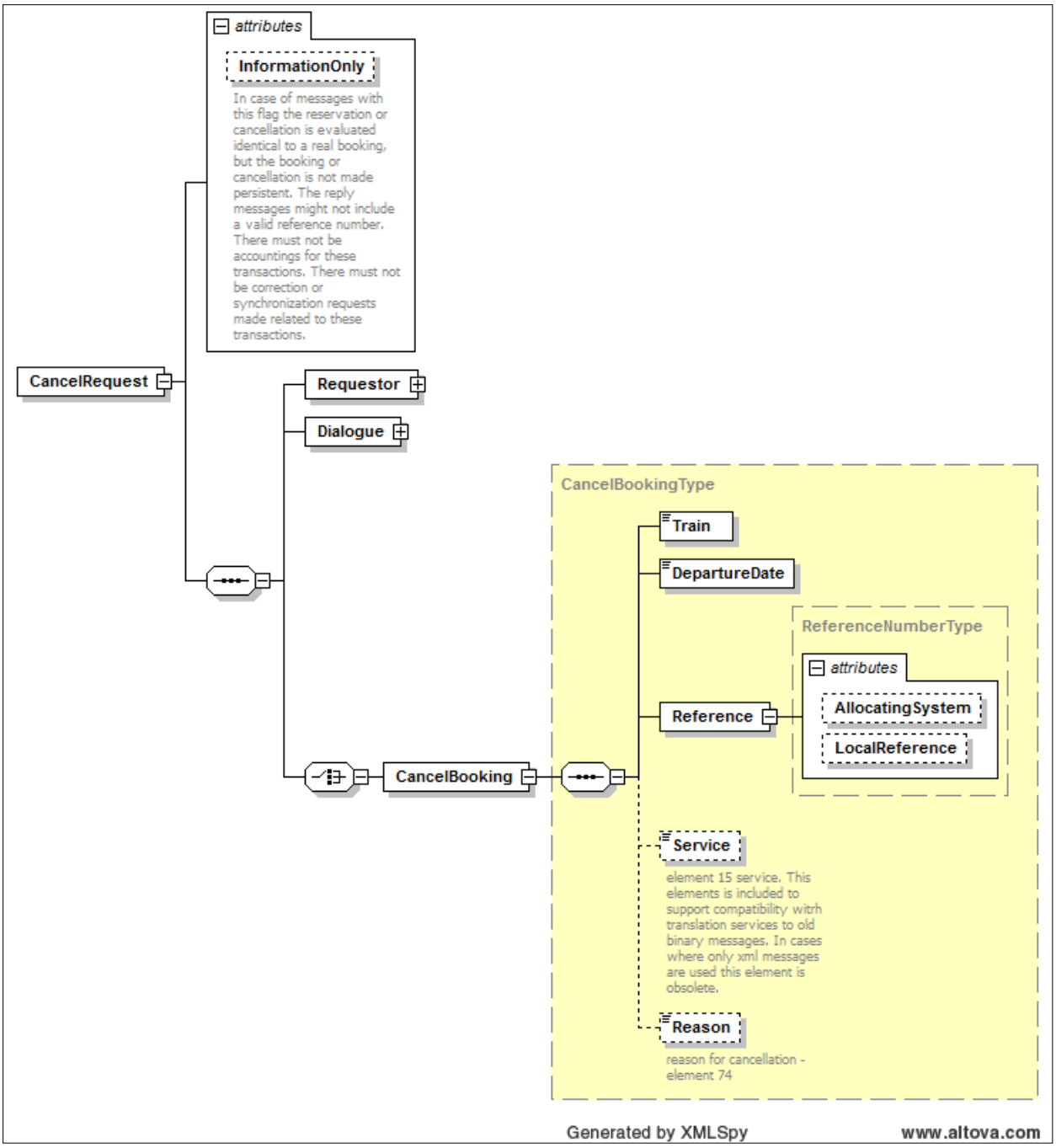


Reply Message:

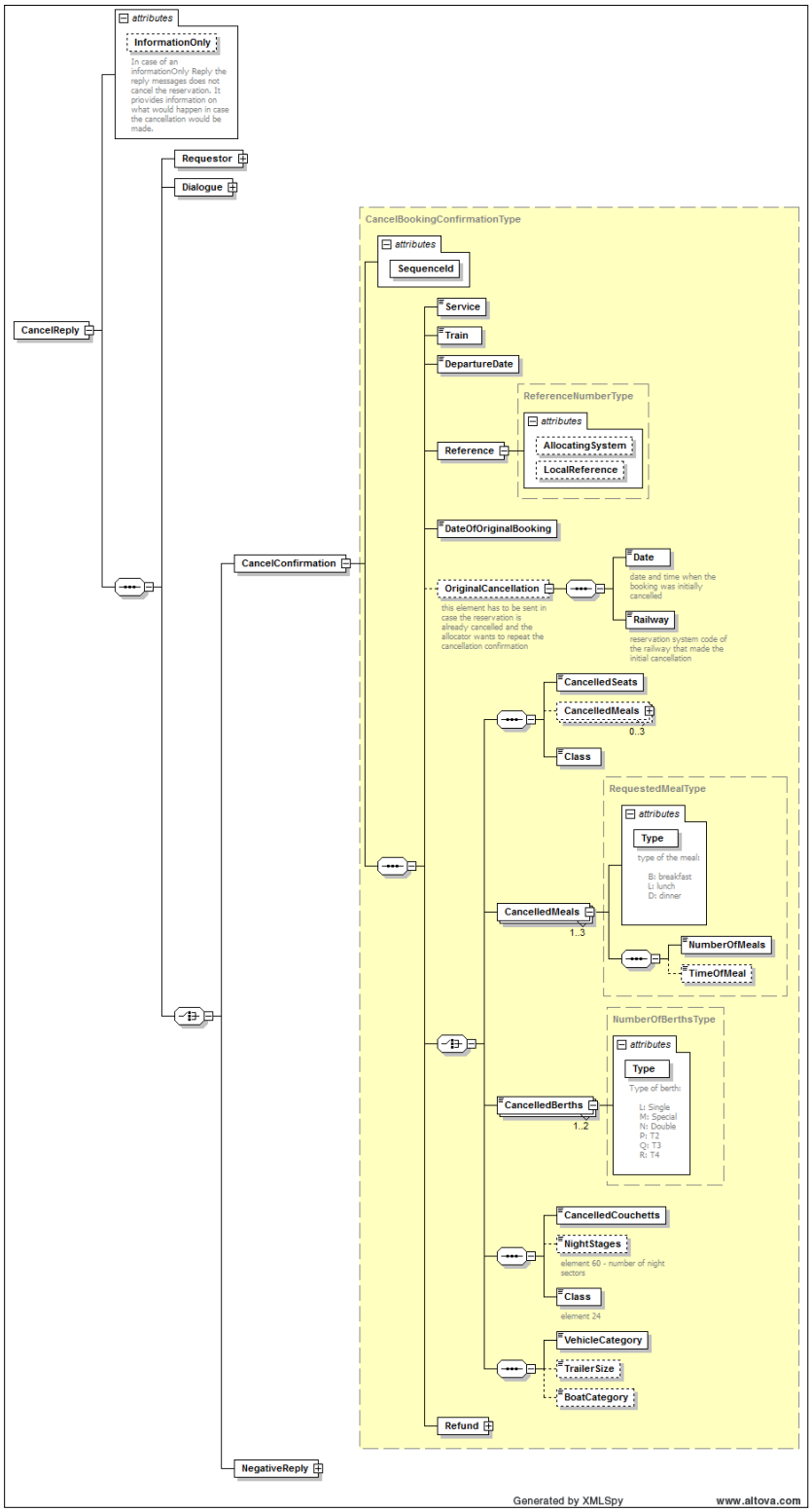


1.1.25 Cancelation

Request Message:

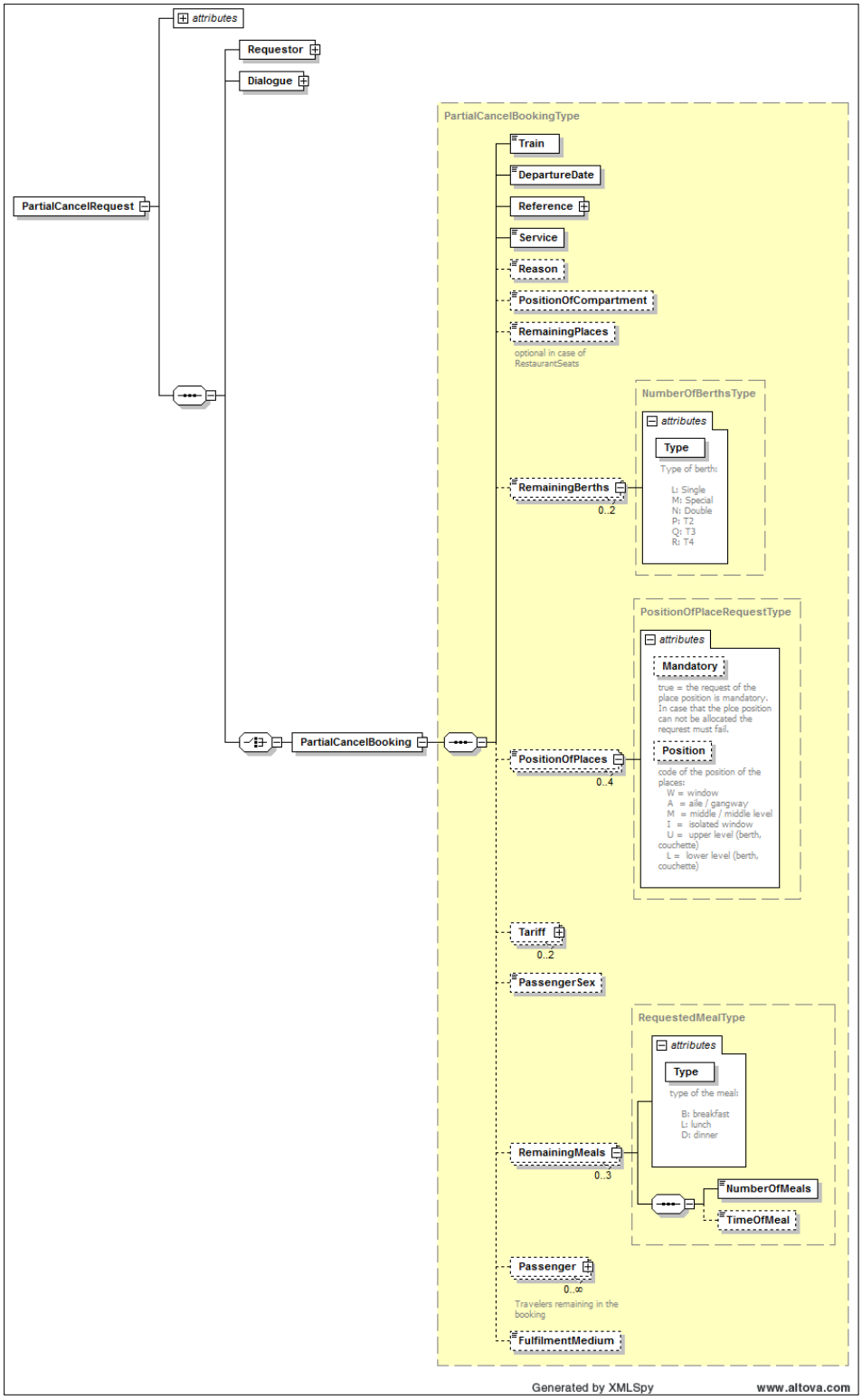


Reply Message:

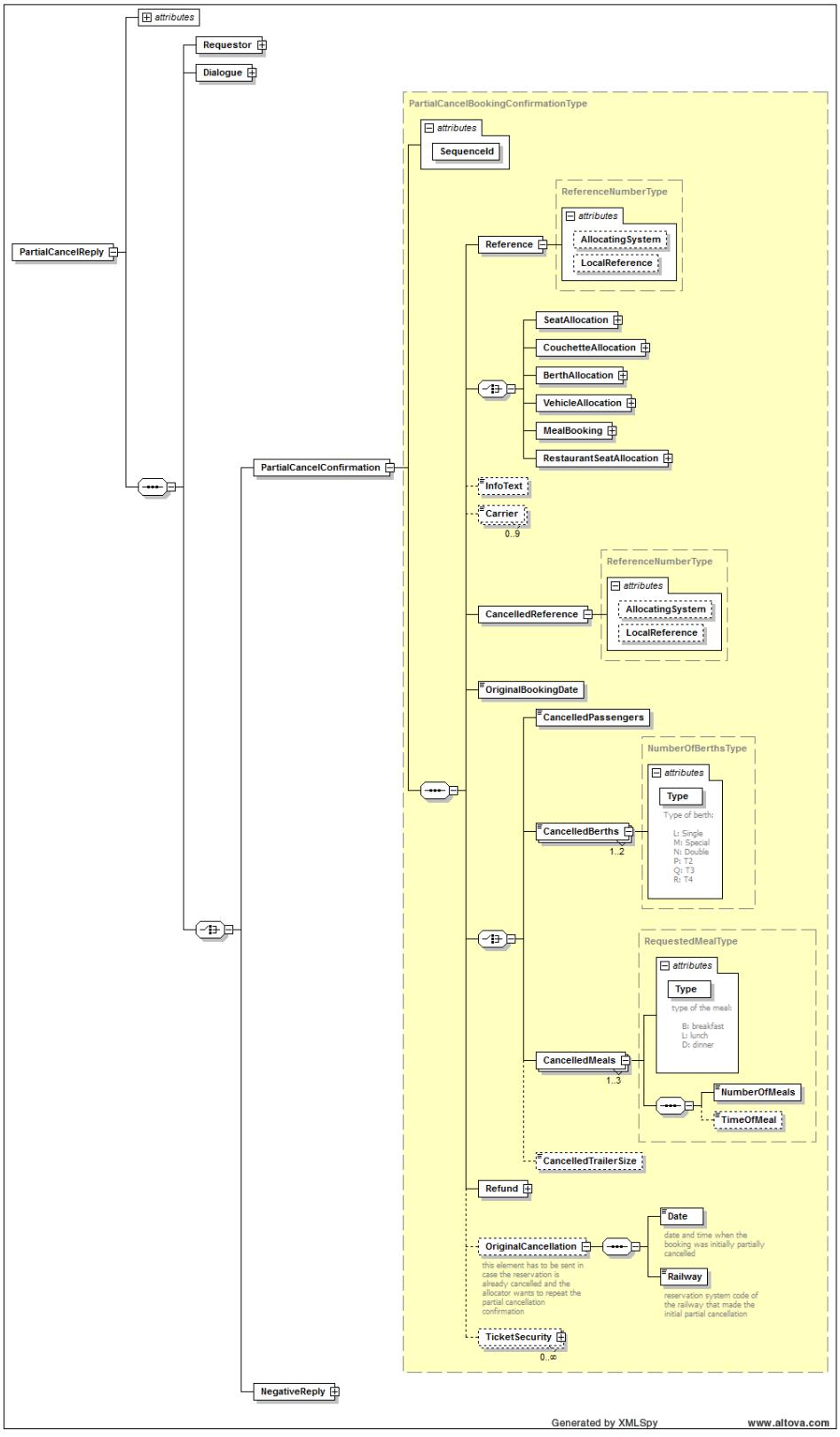


1.1.26 Partial Cancellation

Request Message:



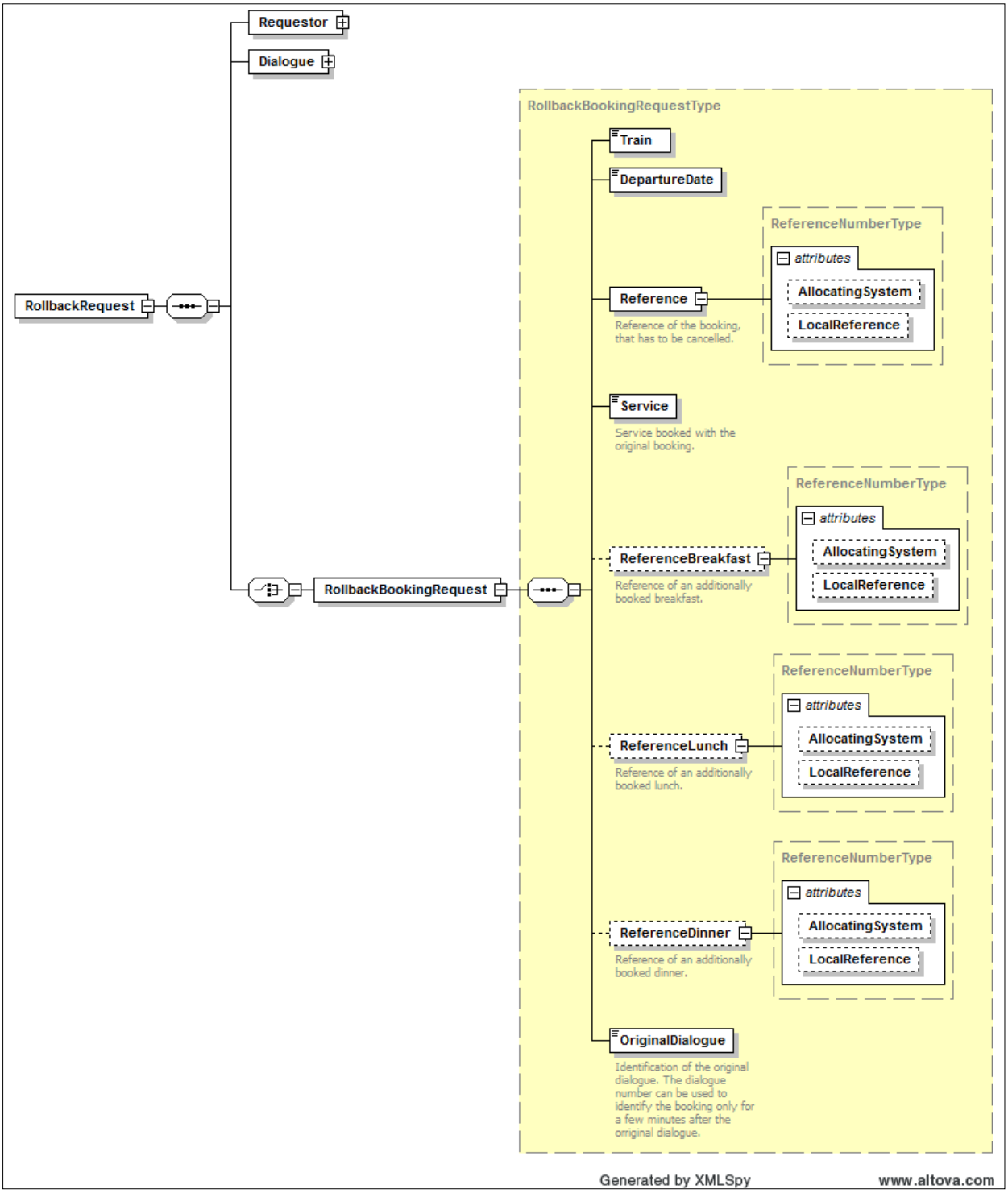
Reply Message:


attributes
Requestor
Dialogue
PartialCancelReply
PartialCancelConfirmation
NegativeReply
PartialCancelBookingConfirmationType
attributes
SequenceId
ReferenceNumberType
attributes
AllocatingSystem
LocalReference
Reference
SeatAllocation
CouchetteAllocation
BerthAllocation
VehicleAllocation
MealBooking
RestaurantSeatAllocation
InfoText
Carrier
0..9
ReferenceNumberType
attributes
AllocatingSystem
LocalReference
CancelledReference
OriginalBookingDate
CancelledPassengers
NumberOfBerthsType
attributes
Type
Type of berth:
L: Single
M: Special
N: Double
P: T2
Q: T3
R: T4
CancelledBerths
1..2
RequestedMealType
attributes
Type
type of the meal:
B: breakfast
L: lunch
D: dinner
CancelledMeals
1..3
NumberOfMeals
TimeOfMeal
CancelledTrailerSize
Refund
OriginalCancellation
this element has to be sent in case the reservation is already cancelled and the allocator wants to repeat the partial cancellation confirmation
Date
date and time when the booking was initially partially cancelled
Railway
reservation system code of the railway that made the initial partial cancellation
TicketSecurity
0..∞
Generated by XMLSpy
www.altova.com

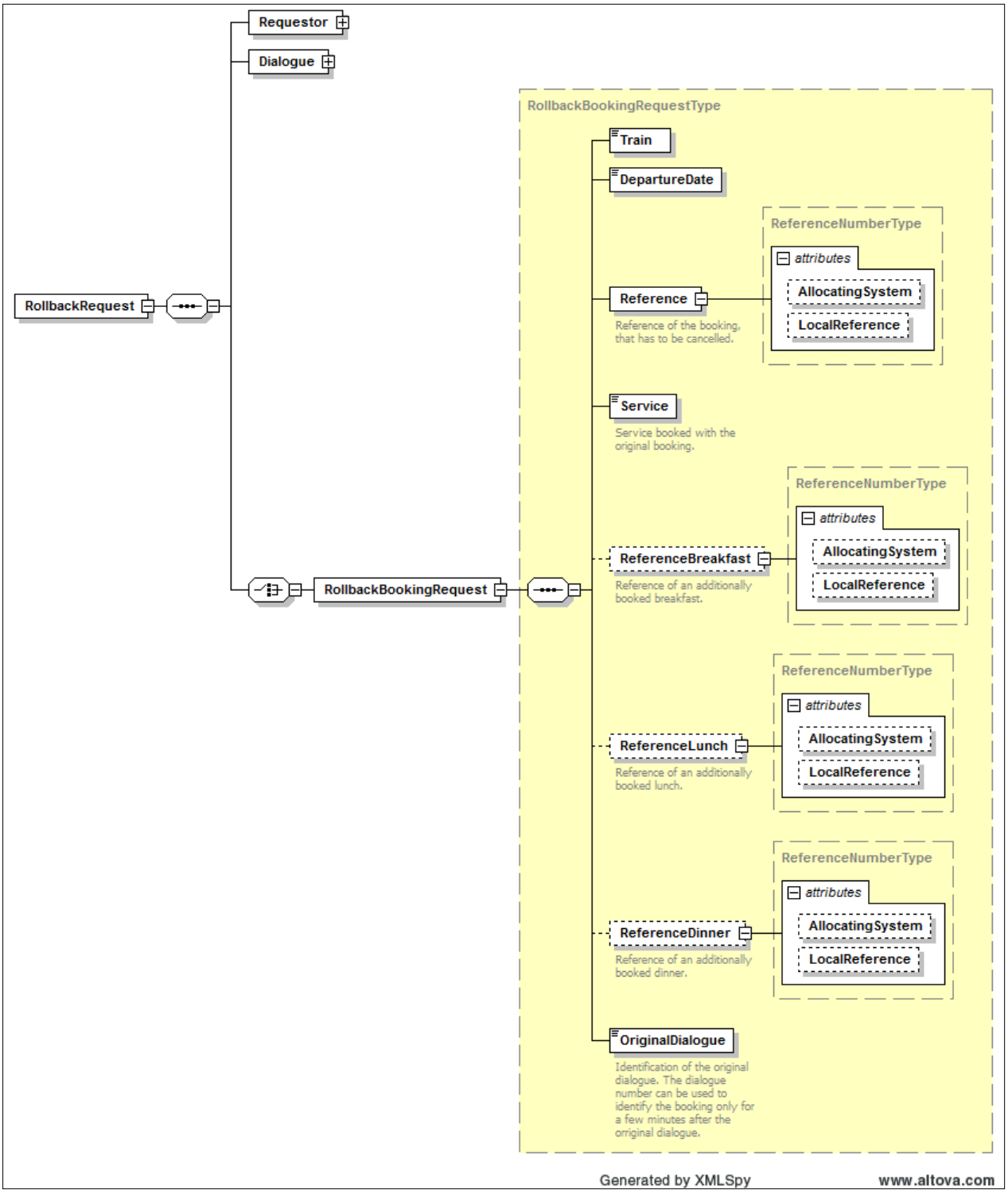
1.1.27 Rollback

These messages correspond to the binary correction messages.

Request message:

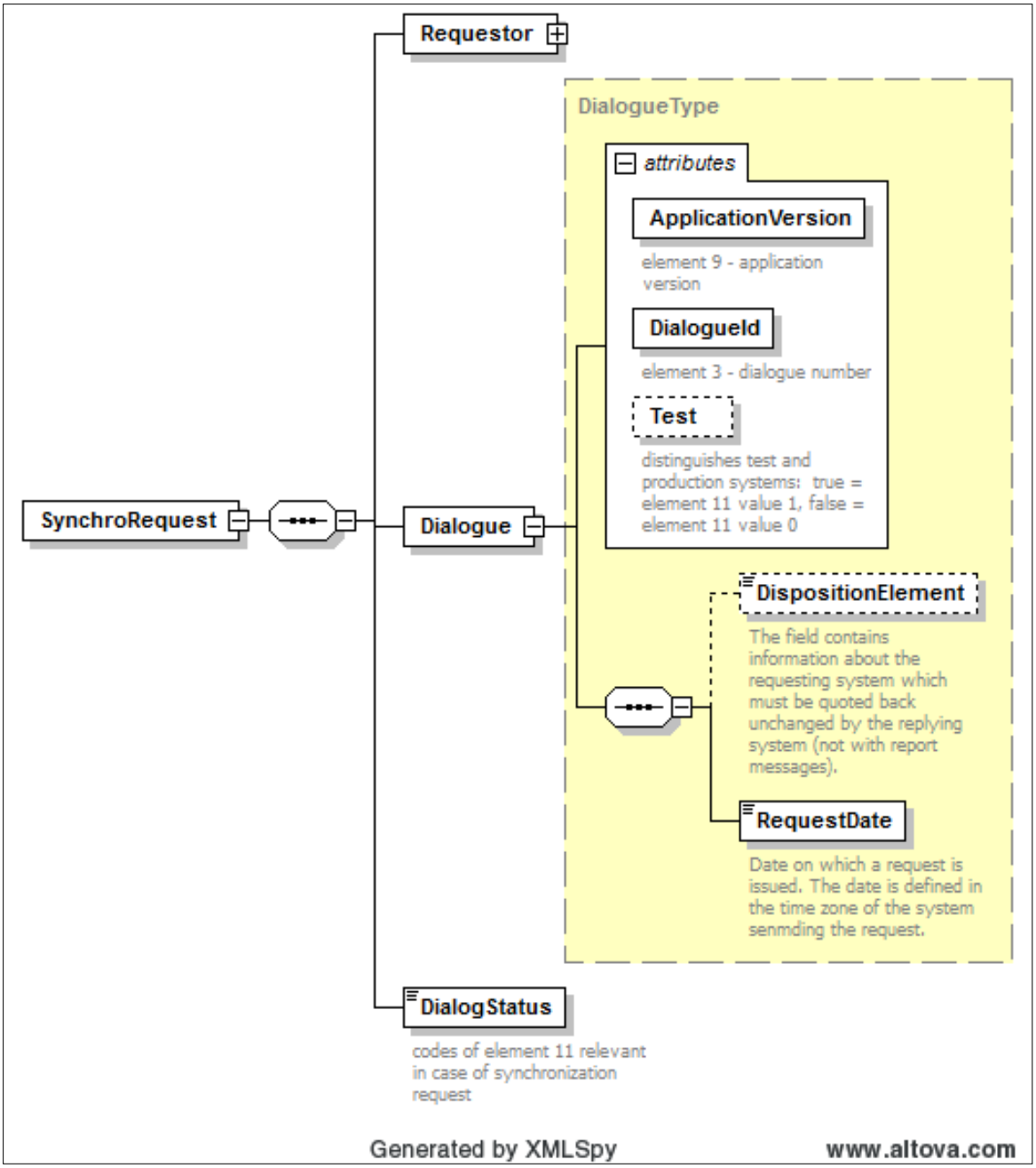


Reply Message:

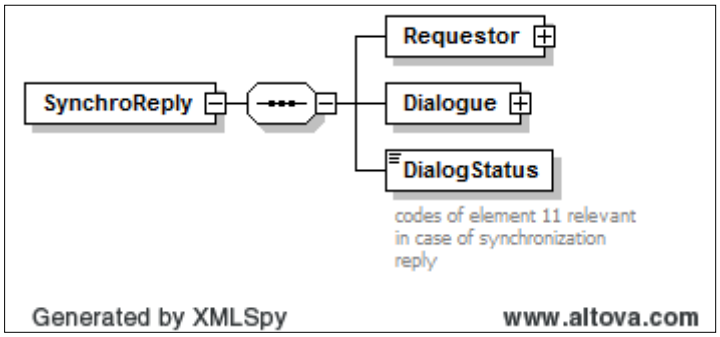

Requestor
Dialogue
RollbackRequest
RollbackBookingRequest
RollbackBookingRequestType
Train
DepartureDate
Reference
Reference of the booking, that has to be cancelled.
ReferenceNumberType
attributes
AllocatingSystem
LocalReference
Service
Service booked with the original booking.
ReferenceBreakfast
Reference of an additionally booked breakfast.
ReferenceLunch
Reference of an additionally booked lunch.
ReferenceDinner
Reference of an additionally booked dinner.
OriginalDialogue
Identification of the original dialogue. The dialogue number can be used to identify the booking only for a few minutes after the original dialogue.
Generated by XMLSpy
www.altova.com

1.1.28 Synchronization

Request message:

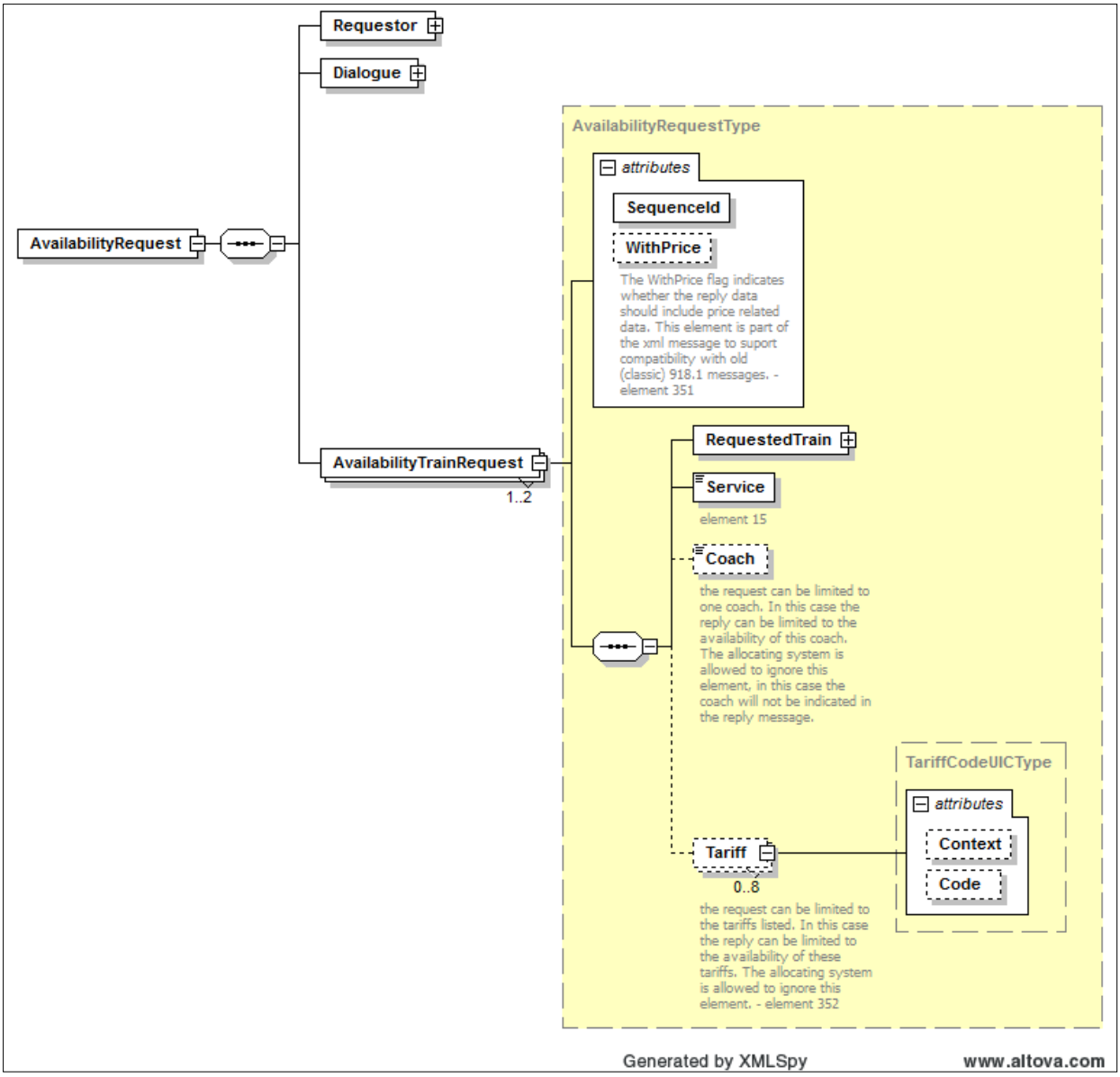


Reply Message:

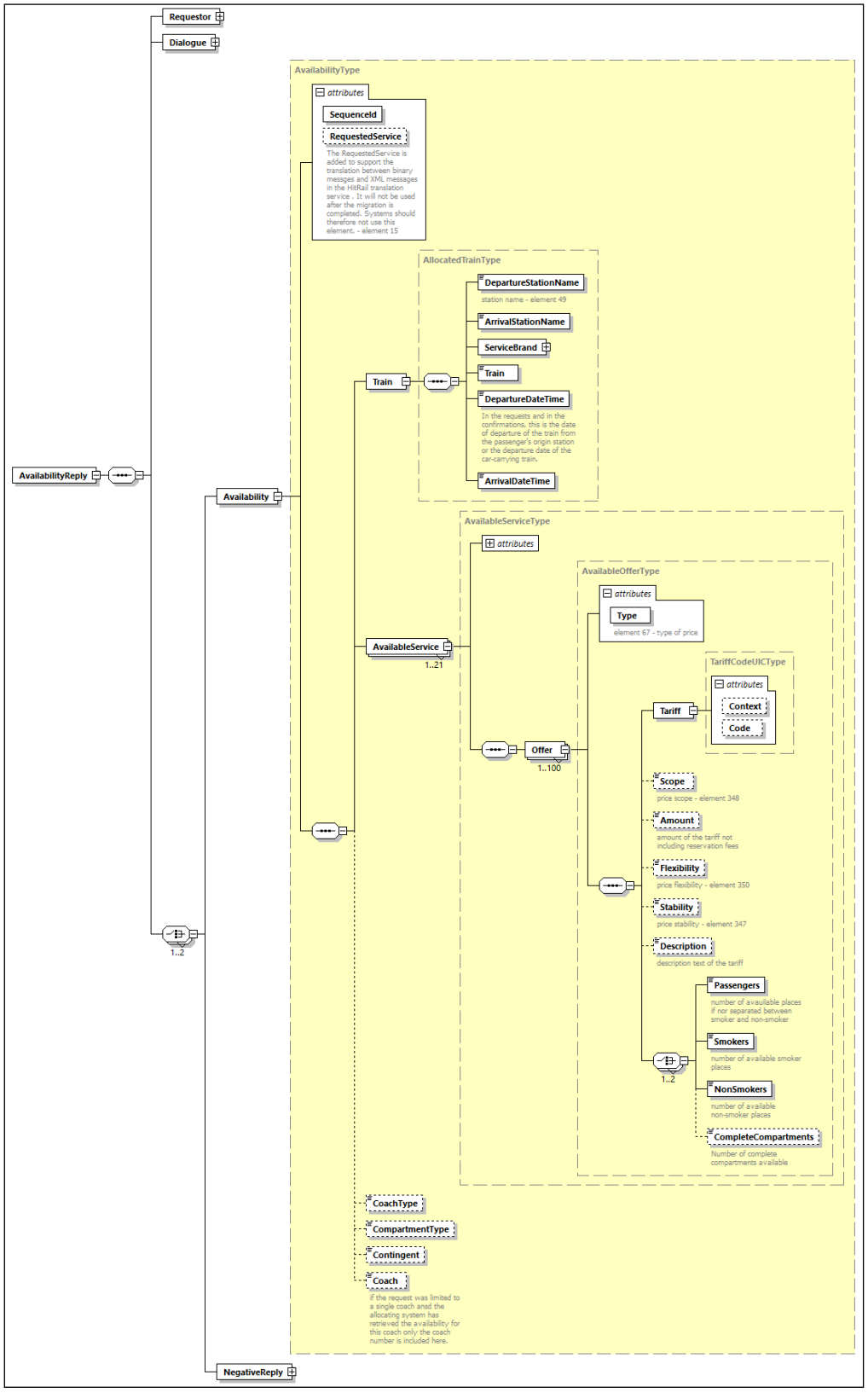


1.1.29 Availability

Request Message:



Reply Message:



1.1.30 E-Ticketing support

The scope of these extensions is to implement an interoperable data exchange during the booking process needed to support the control of the customer authorization to travel on a train (e-ticket):

- to allow to travel by personal data
- to allow to travel by id
- to allow to download a boarding pass from the carrier
- to allow the carrier to contact the traveler
- to satisfy national legislation for personal data on cross border trains (e.g. Russian, Belgium, train on ferries)

1.1.31 Add personal data to an existing booking

Personal data can be added to an existing booking using the AddPersonalData message.

The same message can be used to modify these data. In this case the complete data have to be sent and will replace the previous data.

Errors can occur in case the booking cannot be retrieved or is outdated (e.g. the travel date has passed).

An error can occur in case the personal data provided are incomplete. In case the personal data do not fulfill the requirements of the booking the ticket must not be issued.

A tag MissingData has been added to the negative reply to indicate which tags are missing. This tag will include the name of the missing tag of the personal data.

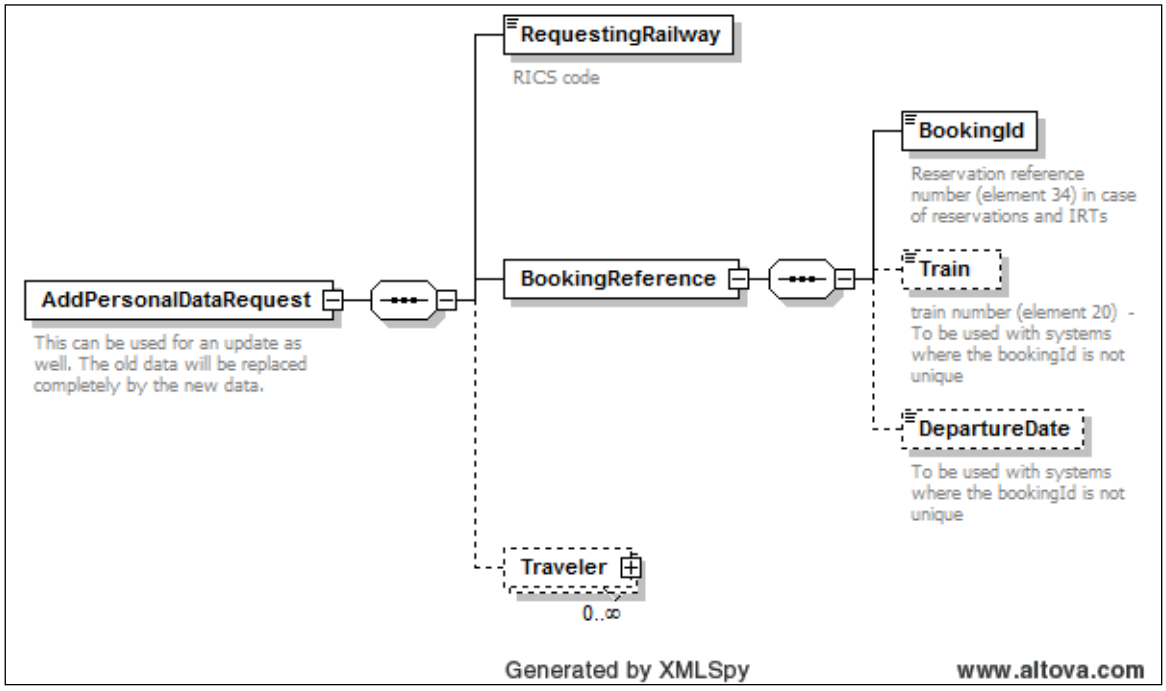
In case contact data of the passenger have been provided to the allocating railway the allocating railway must wait for an appropriate time to contact the passenger as the sales process of the issuer might not have been completed yet.

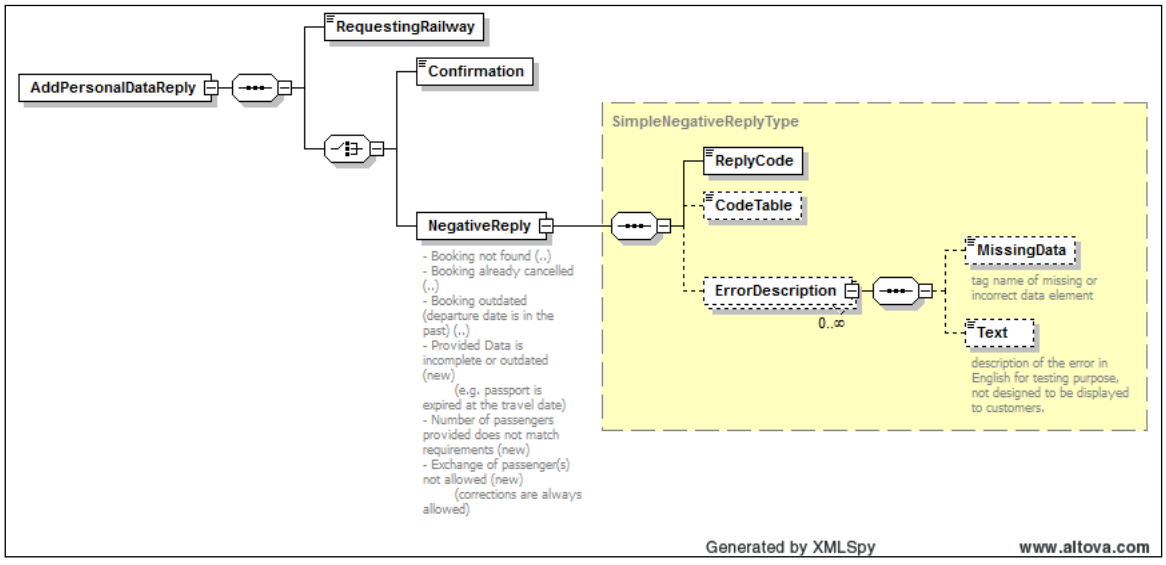
In case a booking with personal data is cancelled the personal data must be deleted according to the EU data protection regulation.

The message contains the booking reference to identify the booking. The train and departure date have been added optionally to support bookings in systems where the booking reference is not yet unique.

In case of a timeout the request can be repeated.

For some tariffs it might not be allowed to replace a person, but according to the GDPR personal data must be changed on request of a passenger. Identification of the passenger to check non-transferable tickets must be made in the system keeping the customer account data.


RequestingRailway
RICS code
BookingId
Reservation reference number (element 34) in case of reservations and IRTs
AddPersonalDataRequest
This can be used for an update as well. The old data will be replaced completely by the new data.
BookingReference
Train
train number (element 20) - To be used with systems where the bookingId is not unique
DepartureDate
To be used with systems where the bookingId is not unique
Traveler
0..∞
Generated by XMLSpy
www.altova.com

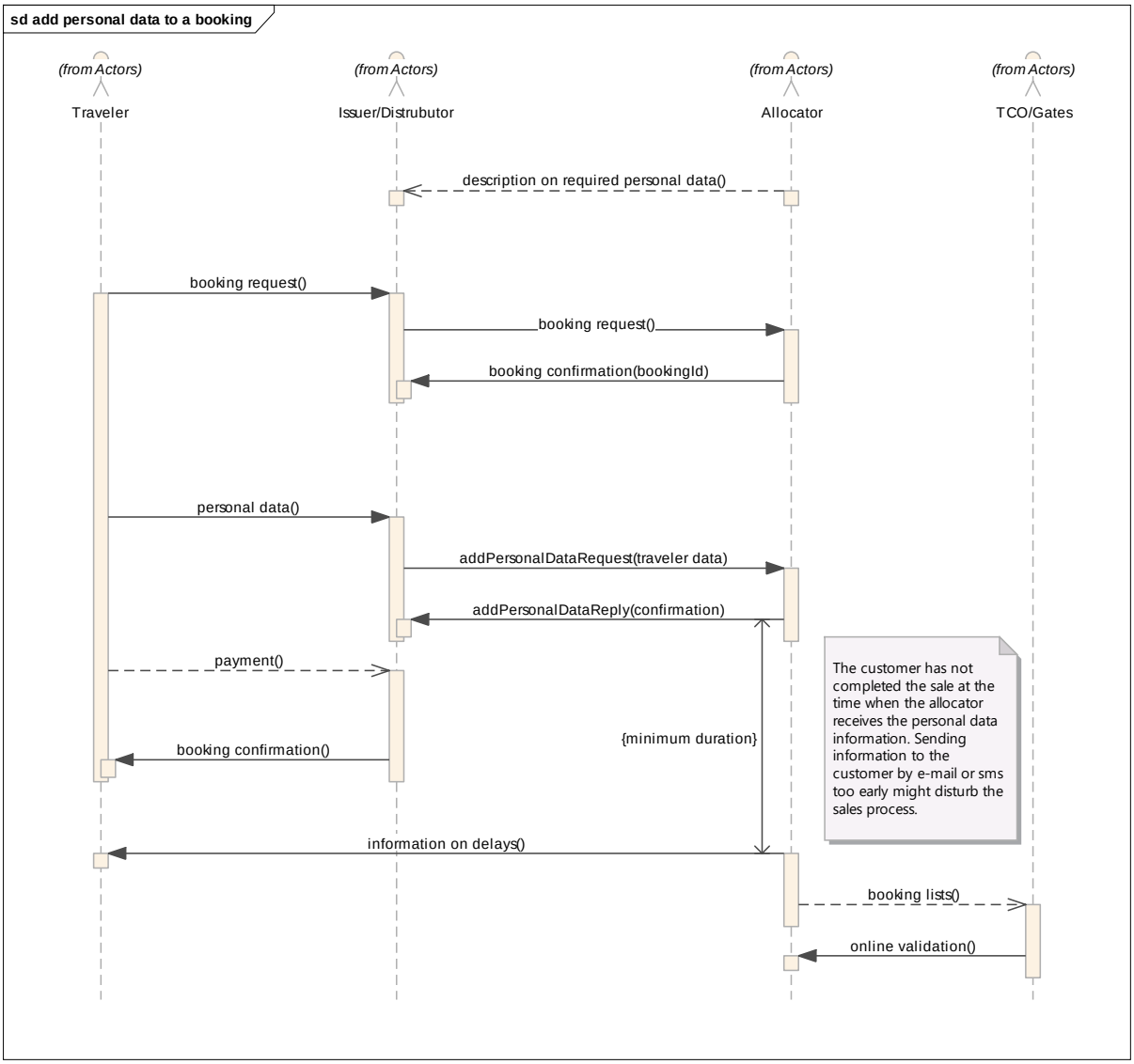

RequestingRailway
AddPersonalDataReply
Confirmation
SimpleNegativeReplyType
ReplyCode
CodeTable
NegativeReply
- Booking not found (..)
- Booking already cancelled (..)
- Booking outdated (departure date is in the past) (..)
- Provided Data is incomplete or outdated (new)
(e.g. passport is expired at the travel date)
- Number of passengers provided does not match requirements (new)
- Exchange of passenger(s) not allowed (new)
(corrections are always allowed)
ErrorDescription
0..∞
MissingData
tag name of missing or incorrect data element
Text
description of the error in English for testing purpose, not designed to be displayed to customers.
Generated by XMLSpy
www.altova.com

1.1.31.1 Scenarios -Add personal data to an existing booking

Scenarios included:

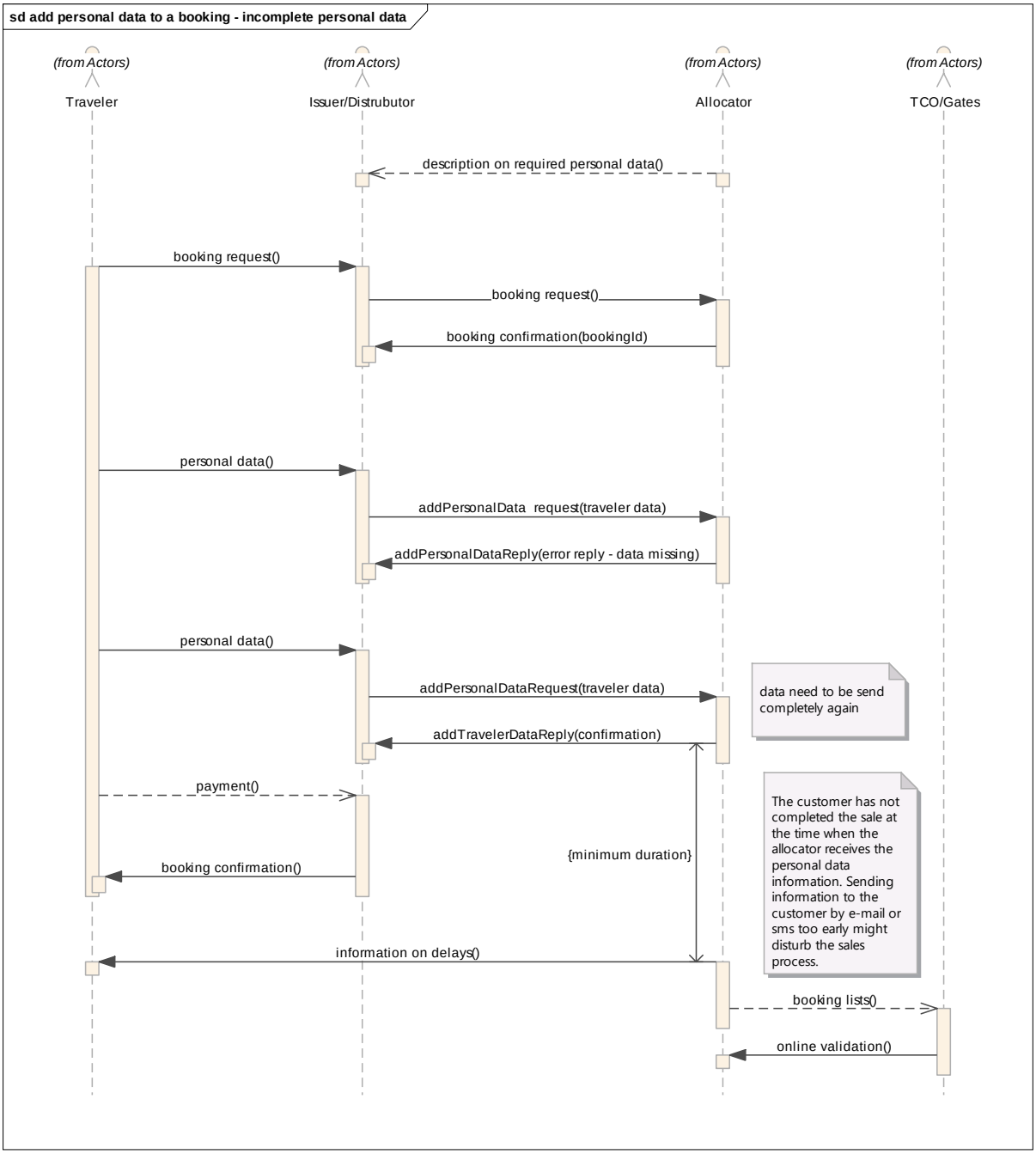
- regular case without errors
- error due to incomplete personal data
- behaviour in case the payment fails

The following scenario describes the exchange of messages in case no error occurs, and the provided data are sufficient for the booking. The allocating railway should have provided the issuer with a description on the use of personal data for its products beforehand.



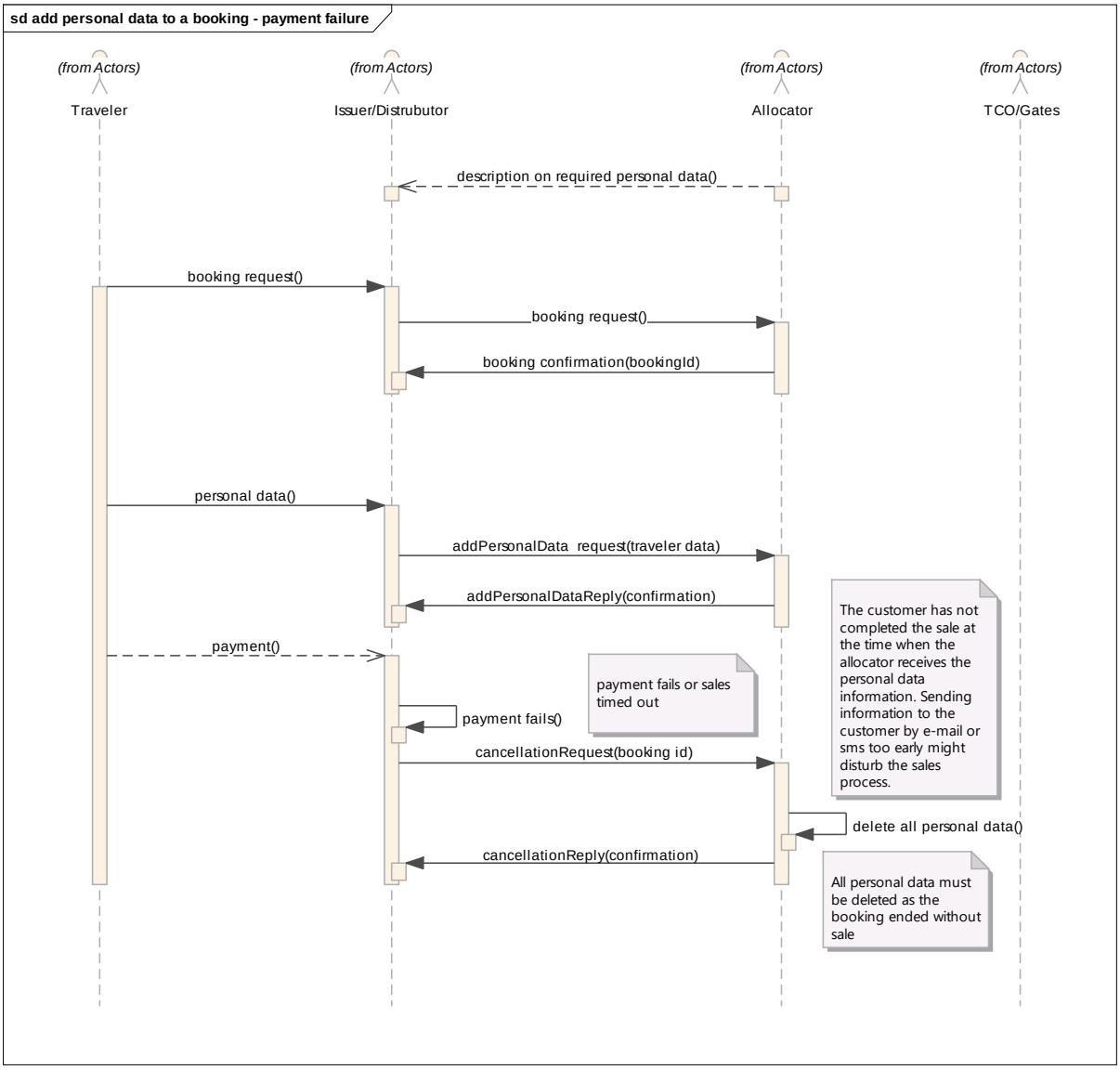
1.1.31.2 Error scenario – the personal data provided are not sufficient:

The allocating system answers with a negative reply optionally indicating the missing personal data. The issuing system can resend the completed data.



1.1.31.3 Error scenario – payment failure:

In this scenario the data exchange between issuing railway and allocating railway has no error, but the issuer cannot finalize the payment. The issuer cancels the booking and provides ”before payment” as reason for cancellation. As no contract with the customer has been concluded the personal data must be deleted completely by the allocating railway.

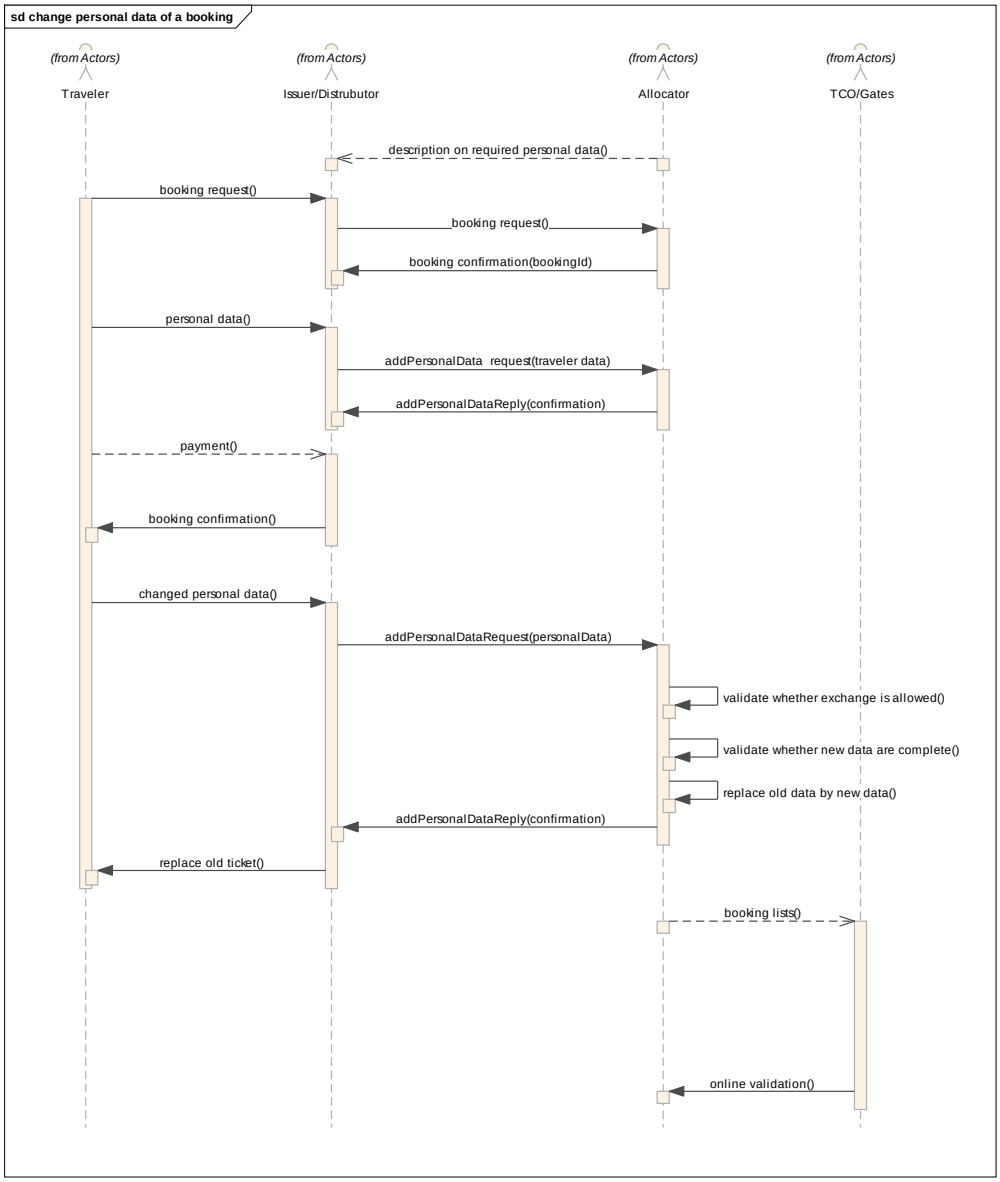


1.1.31.4 Scenarios -Change personal data of an existing booking

Scenarios included:

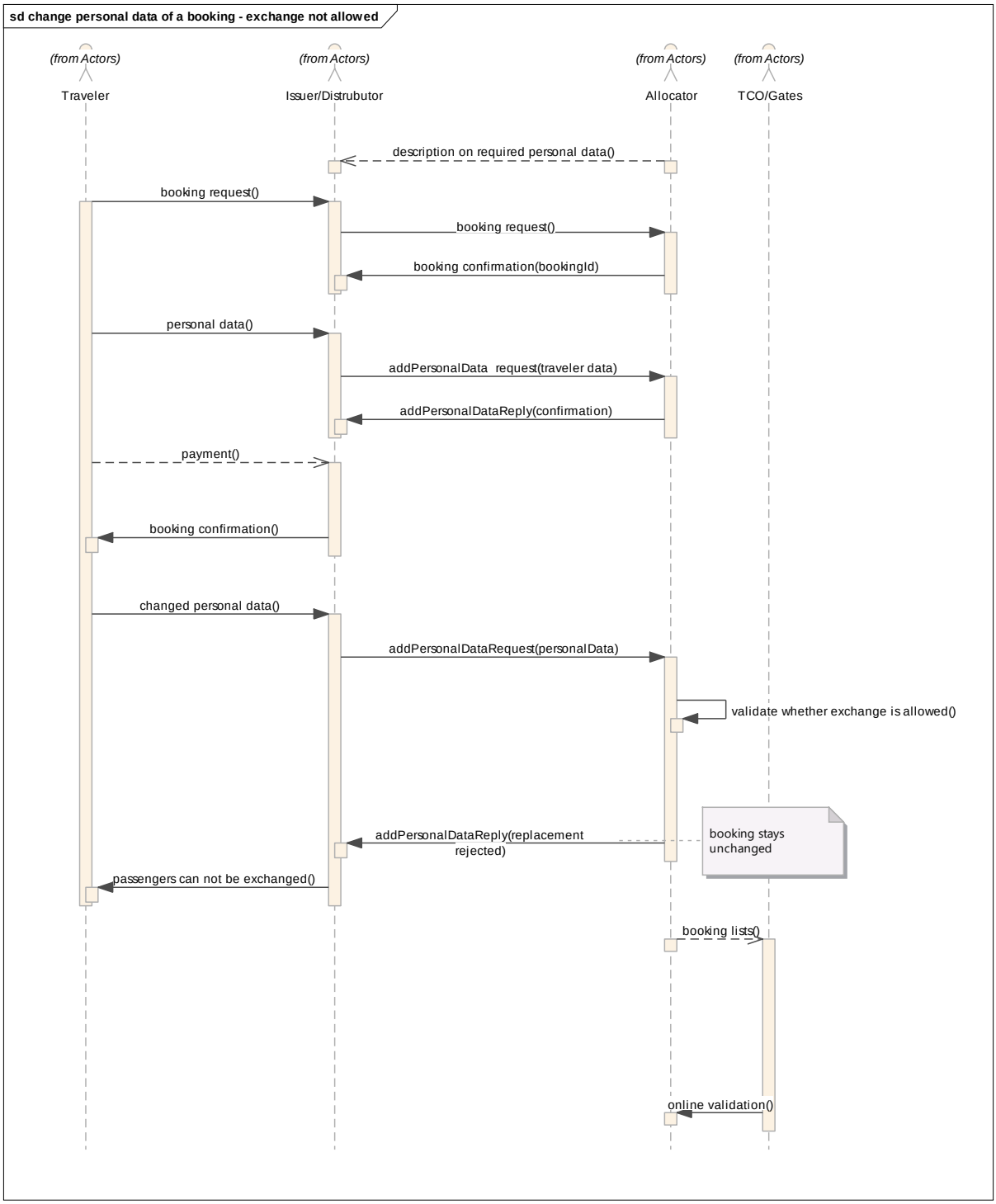
- regular case without errors
- error due to incomplete personal data
- error in case the exchange of personal data is not allowed (the booking is not transferable)

The following scenario describes the exchange of messages in case no error occurs and the provided data are sufficient for the booking. The allocating railway should have provided the issuer with a description on the use of personal data for its products beforehand.



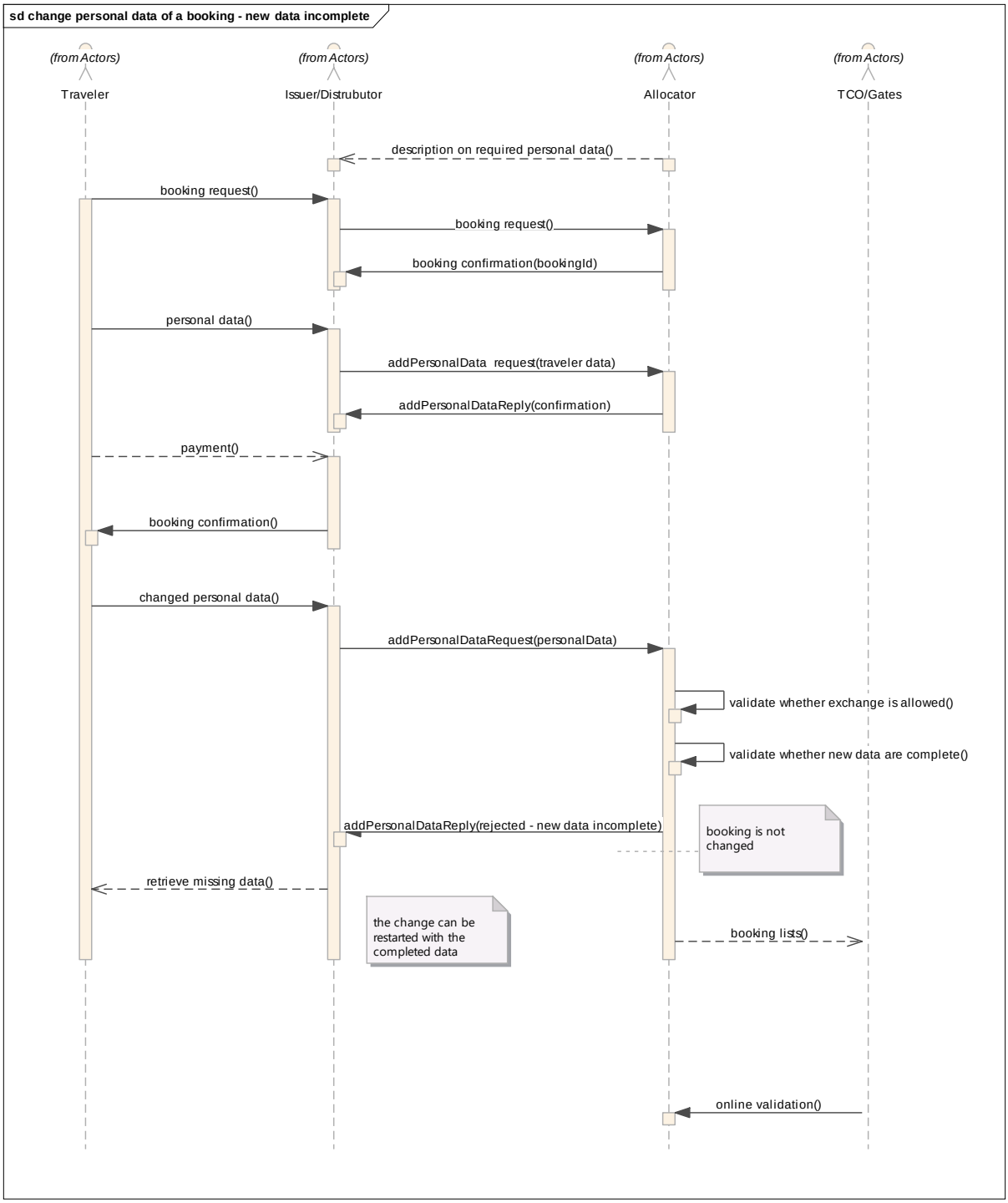
1.1.31.5 Error scenario – exchange not allowed:

In this scenario the provided personal data are not accepted by the allocating railway as the new personal data indicate an exchange of the passenger and the booking is not transferable. The allocating system gives a negative reply indicating that the exchange is not allowed and the booking is not changed.



1.1.31.6 Error scenario – new personal data incomplete:

In this scenario the provided personal data are not accepted by the allocating railway as the new personal data are not complete. The allocating system gives a negative reply and the booking is not changed.

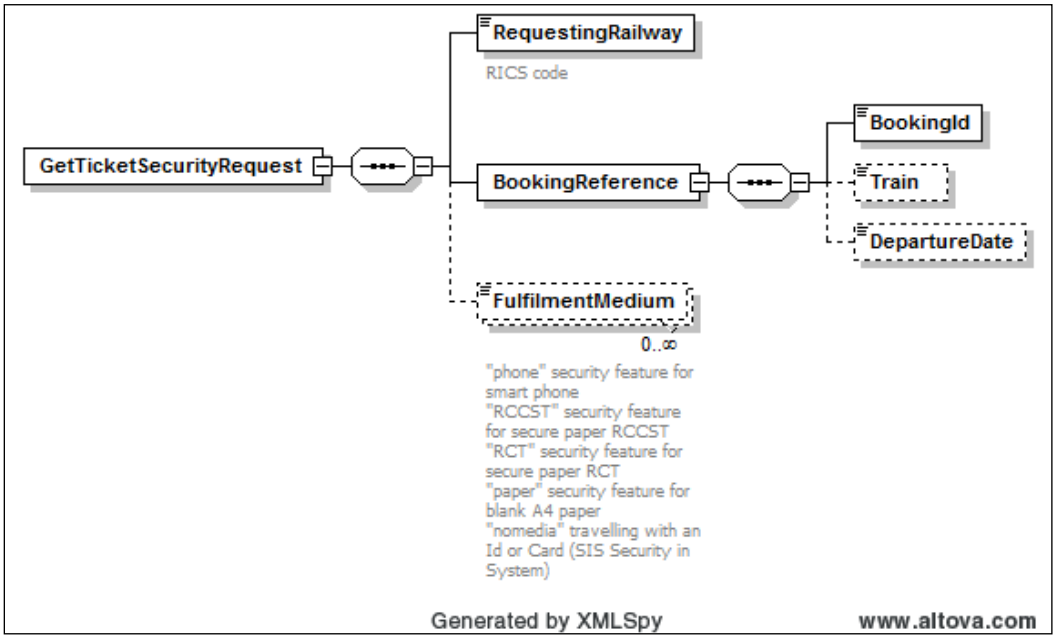


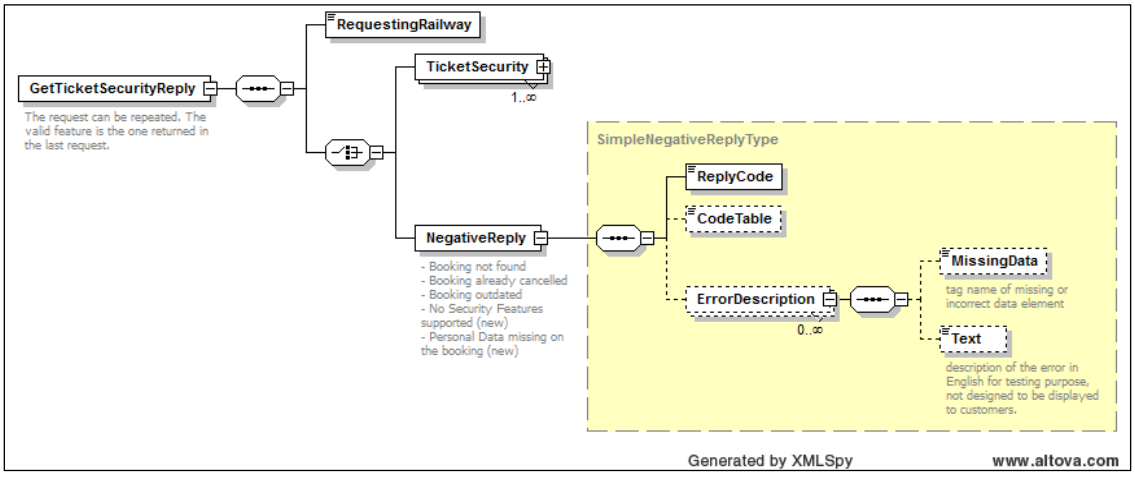
1.1.32 Retrieve security features for an existing booking

Security features needed to fulfil the ticket can be retrieved for an existing booking via the GetSecurityFeaturesRequest message.

The message contains the booking reference to identify the booking. The train and departure date have been added optionally to support bookings in systems where the booking reference is not yet unique. In case the security features provided in the reply contain personal data or the links provided link to data containing personal data the EU data protection regulation applies.

The FulfillmentMedium can be provided to limit the number of security features exchanged. In case of a timeout the request can be repeated. In case there is a change of the FulfillmentMedium the security features can be requested again.



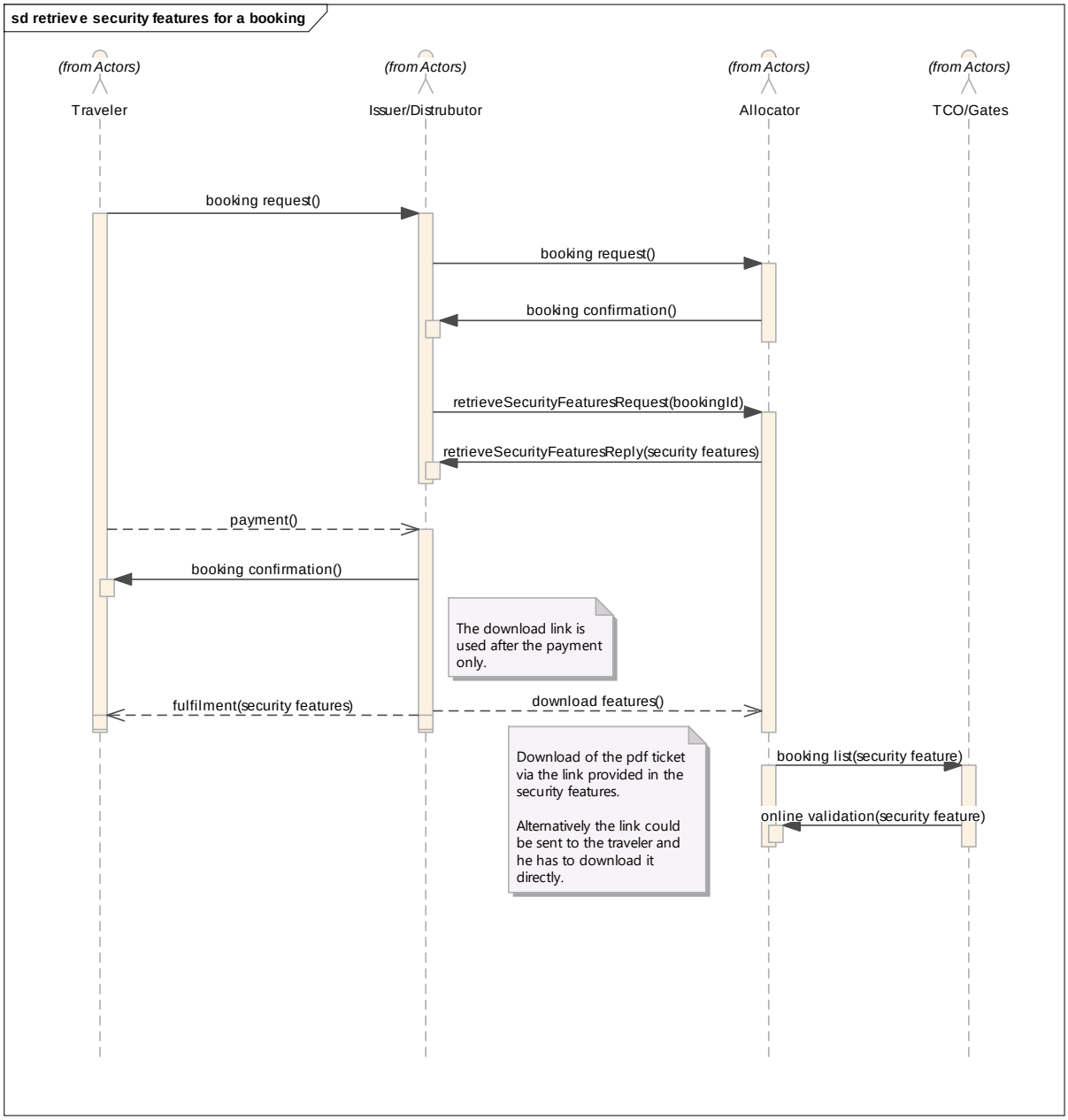


1.1.32.1 Scenarios -Retrieve security features for an existing booking

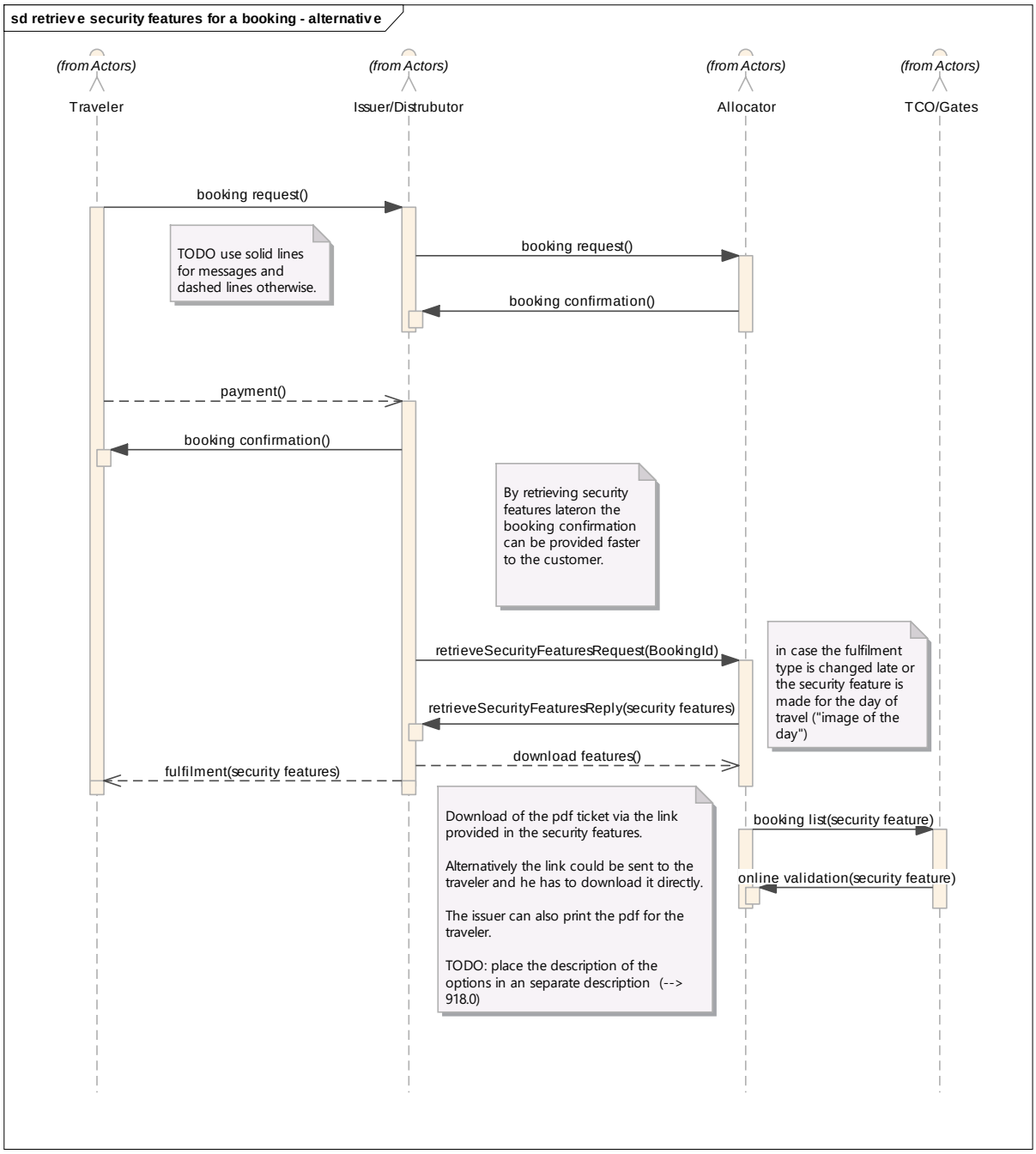
Scenarios included:

- regular case without errors – immediately retrieving security features
- regular case without errors – delayed retrieving security features
- permanent timeout on a request for security features
- temporary timeout on a request for security features

The following scenario describes the exchange of messages in case no error occurs and the security features are requested immediately after completing the booking.

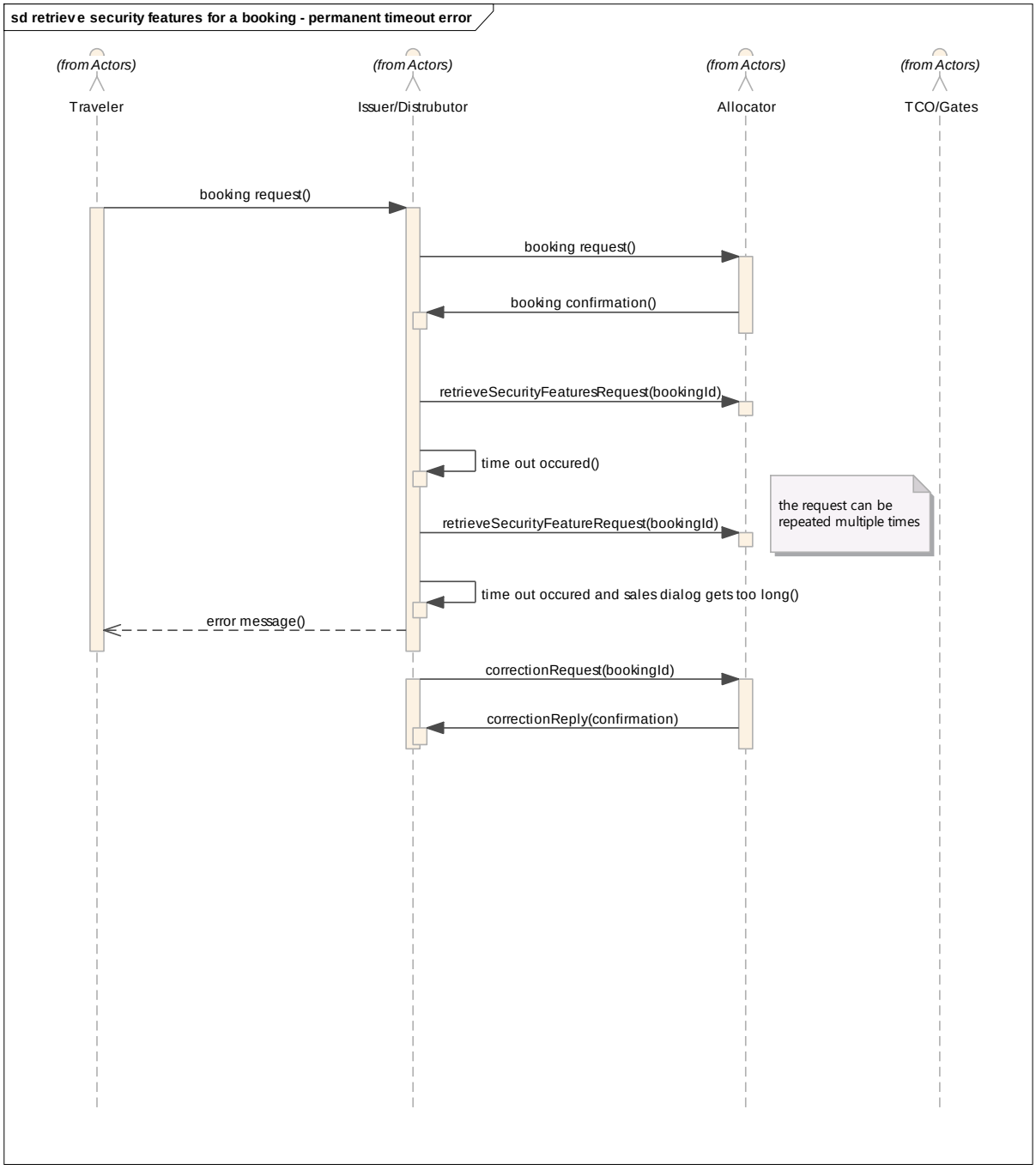


The following scenario describes the exchange of messages in case no error occurs and the security features are requested later on.



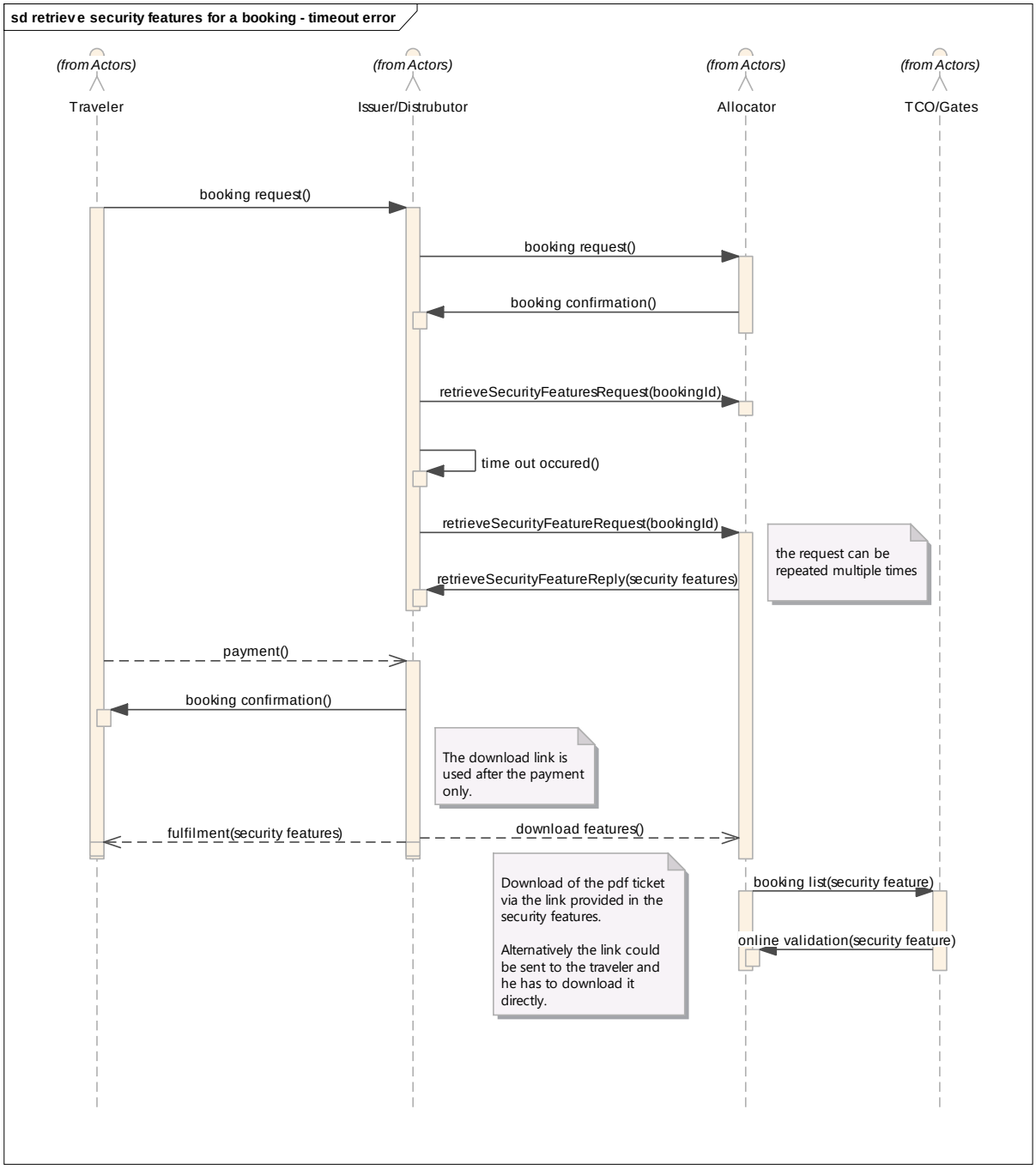
1.1.32.2 Error scenario - permanent timeout on a request for security features:

In case of a permanent timeout the booking has to be cancelled if the security features cannot be retrieved in time.



1.1.32.3 Error scenario - temporary timeout on a request for security features:

In case of a time out the request can be repeated.

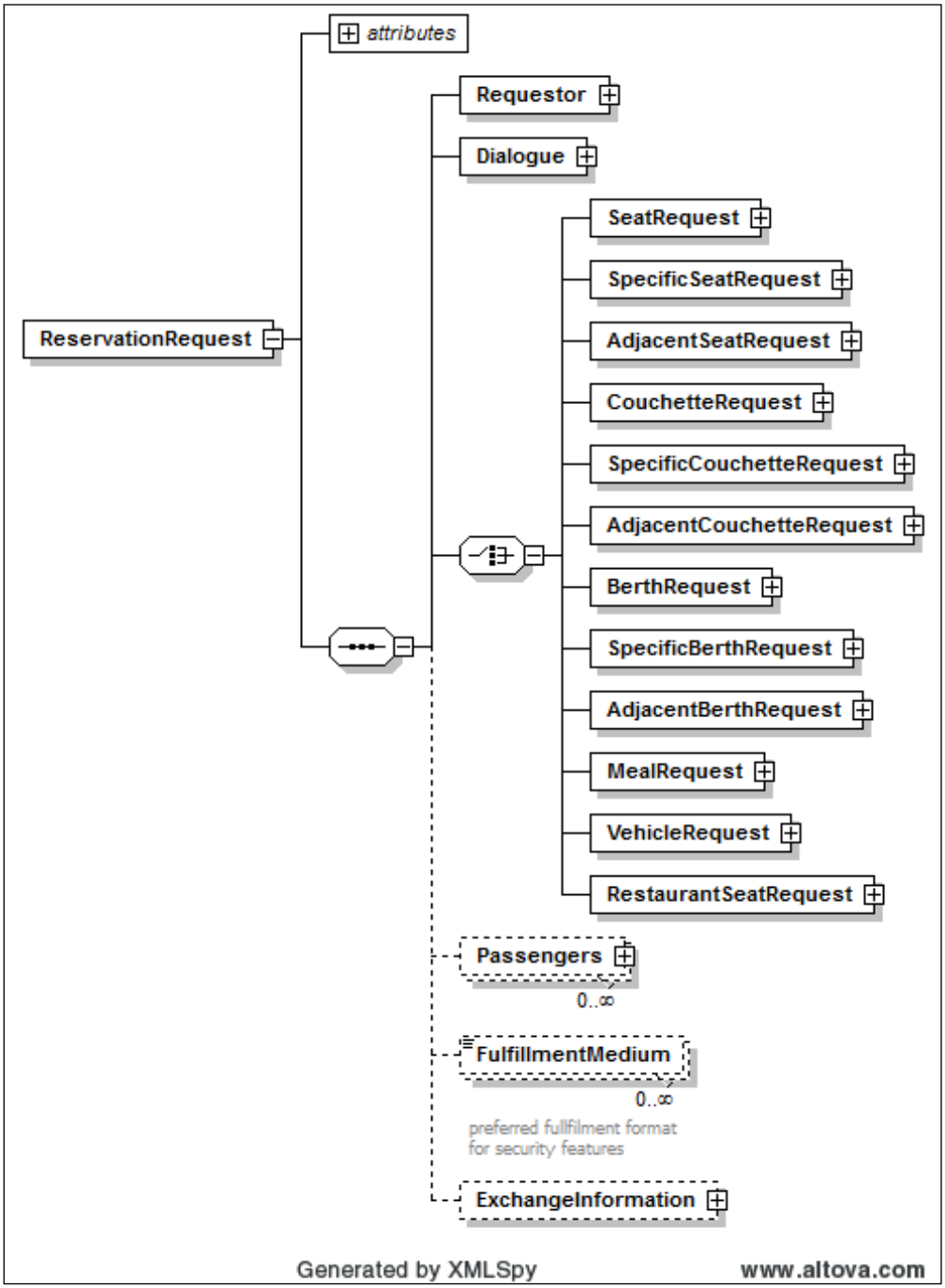


1.1.33 Include personal data in the reservation message

The passenger data are added as “Passengers” list in the reservation request message.

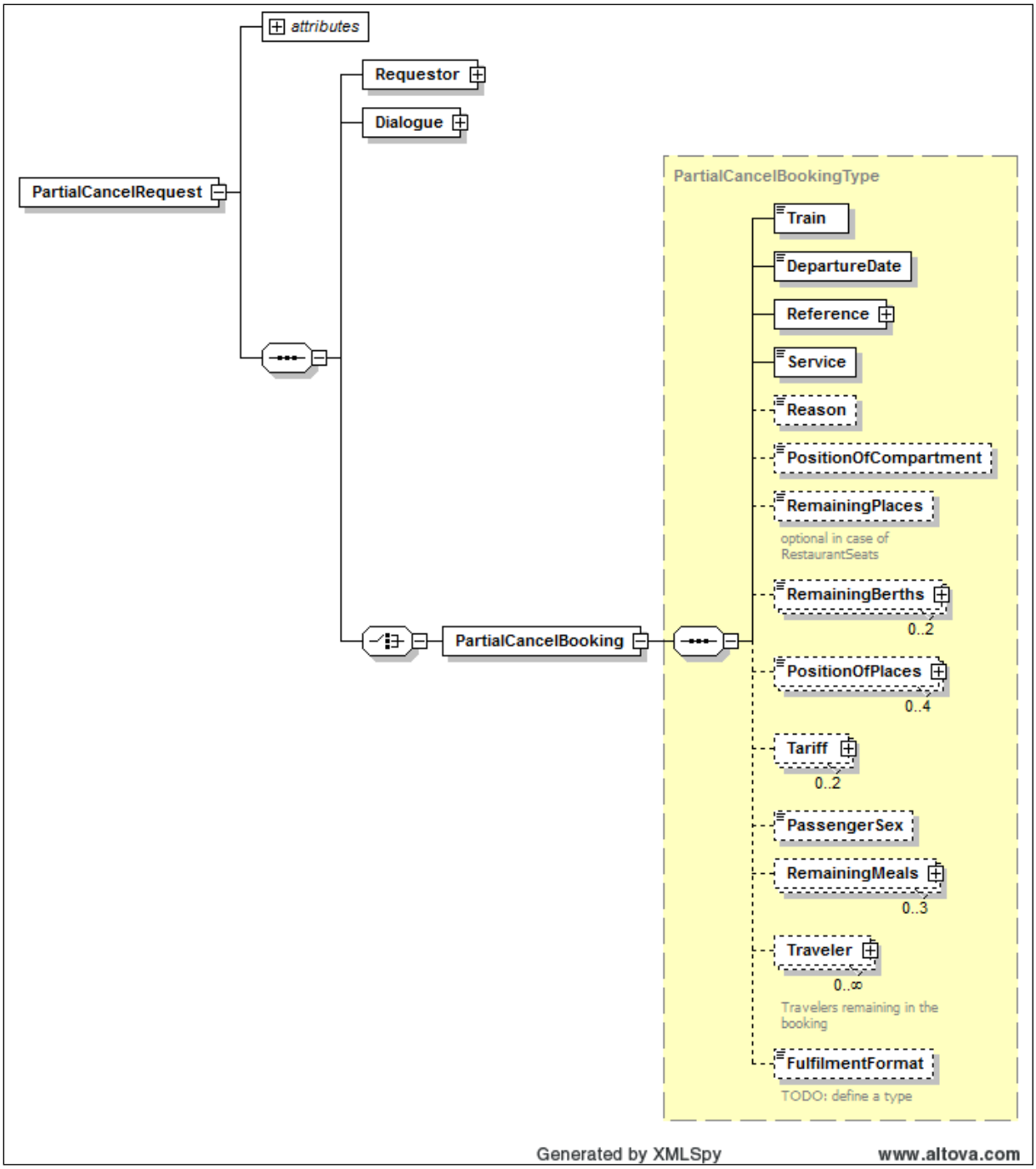
The personal data should be provided completely or be provided in a separate message. In case personal data are provided but are incomplete the booking will be rejected with a negative reply using new error code 003.

Reservation request including personal data:



Partial cancellation request:

In case of a partial cancellations the remaining passengers are provided.



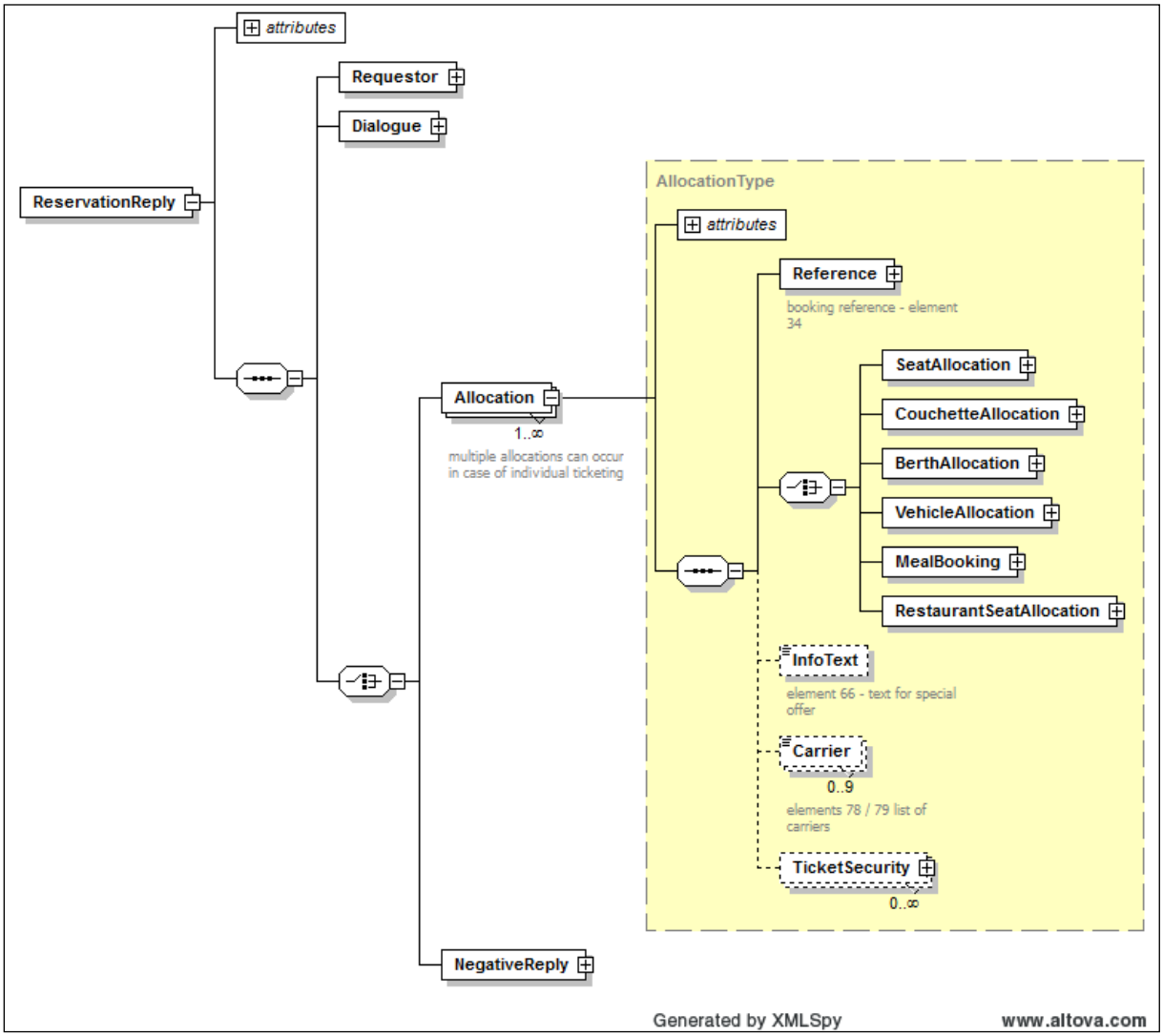
The scenarios for the message exchange in reservation apply.

1.1.34 Include security features in the reservation message

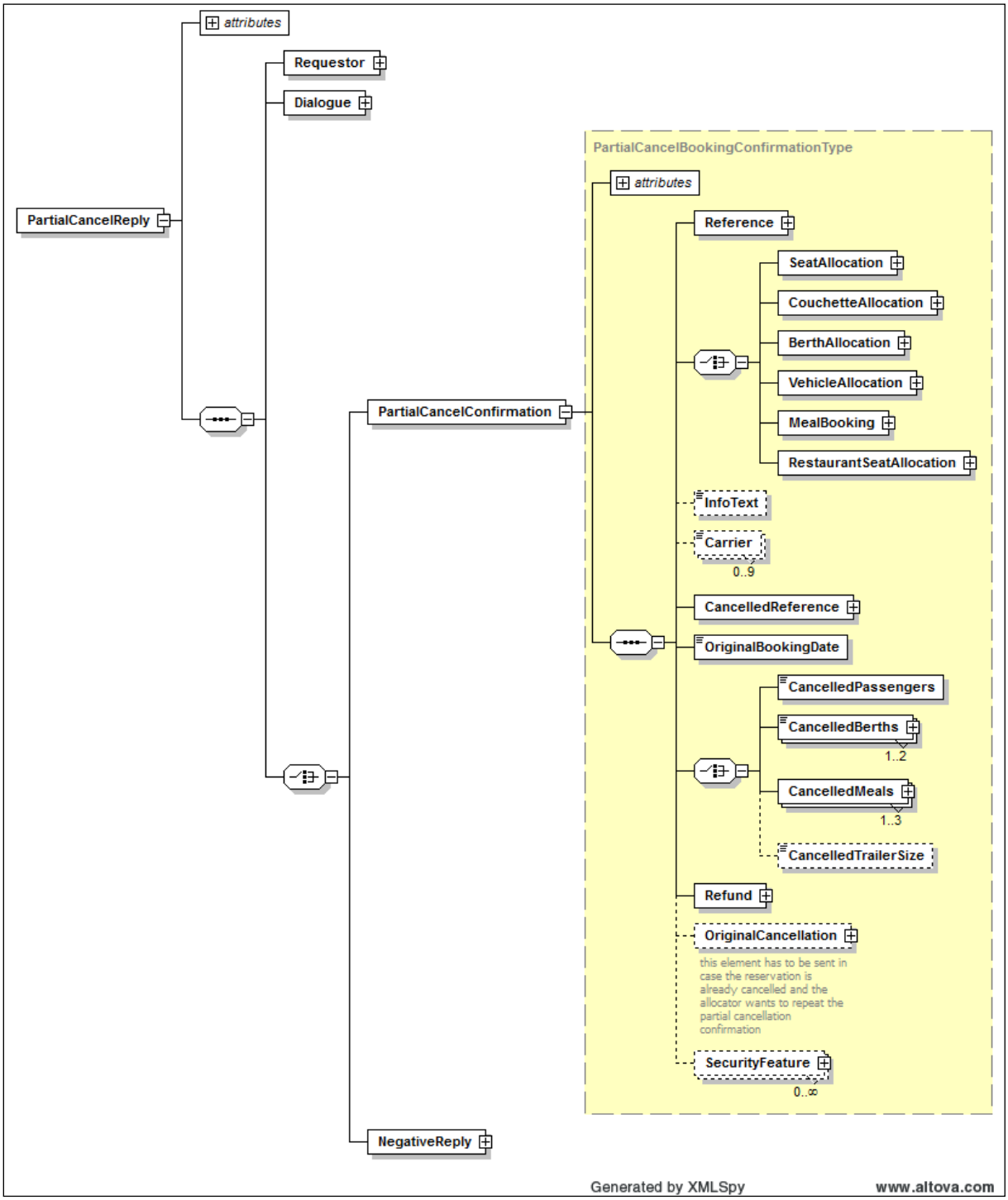
The security feature list was added in the reservation reply message.

The request for reservation and partial cancellation incudes the intended fulfilment type to limit the number of security features transferred (see request message in: Include personal data in the reservation message).

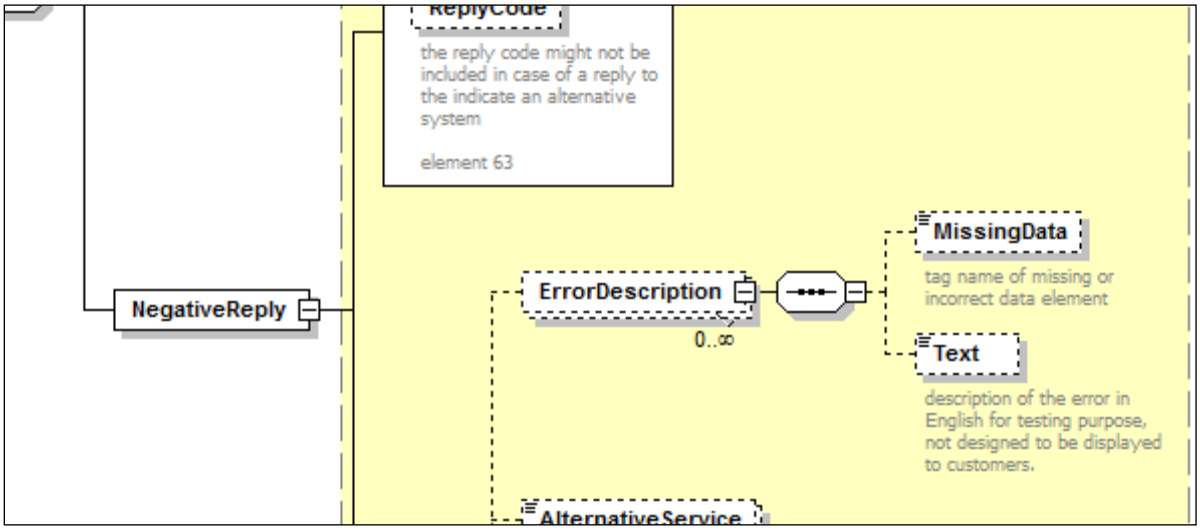
Reservation reply:



Partial cancellation reply:



Extended negative reply to indicate missing data:



The scenarios for the message exchange in reservation apply.

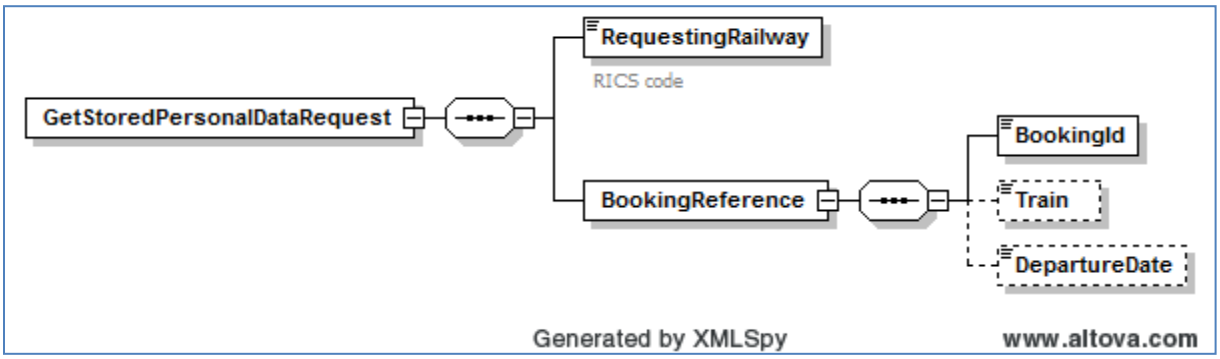
1.1.35 Retrieve personal data for a booking

According to the EU regulation on personal data the customer has the right to receive information on the personal data stored for him. In case personal data have been forwarded to other companies these data must be displayed as well.

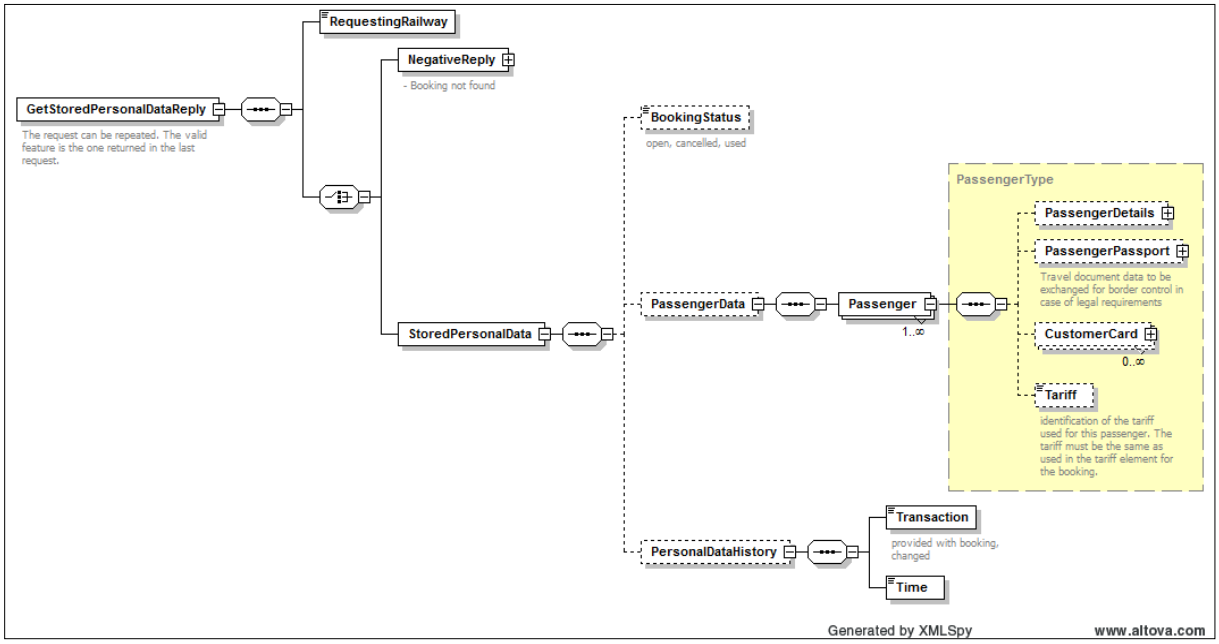
The following messages specify a service to retrieve the personal data stored at an allocator. The issuer can use this message to fulfil his legal obligations to inform the customer on the data stored for him.

It is therefore assumed that the allocator stores the personal data only to for the purpose to handle the specified booking. It is not allowed to store these data outside the context of the booking.

Request to retrieve the stored personal data for a booking:



Reply on the request to retrieve the stored personal data for a booking:



In case no personal data are stored the element “PassengerData” would be missing.

Booking Status:

open	Booking was made and nether changed
cancelled	Booking is cancelled
exchanged	Booking was exchanged
used	Booking was used. Status might be known due to ticket check on board

Transaction on personal data:

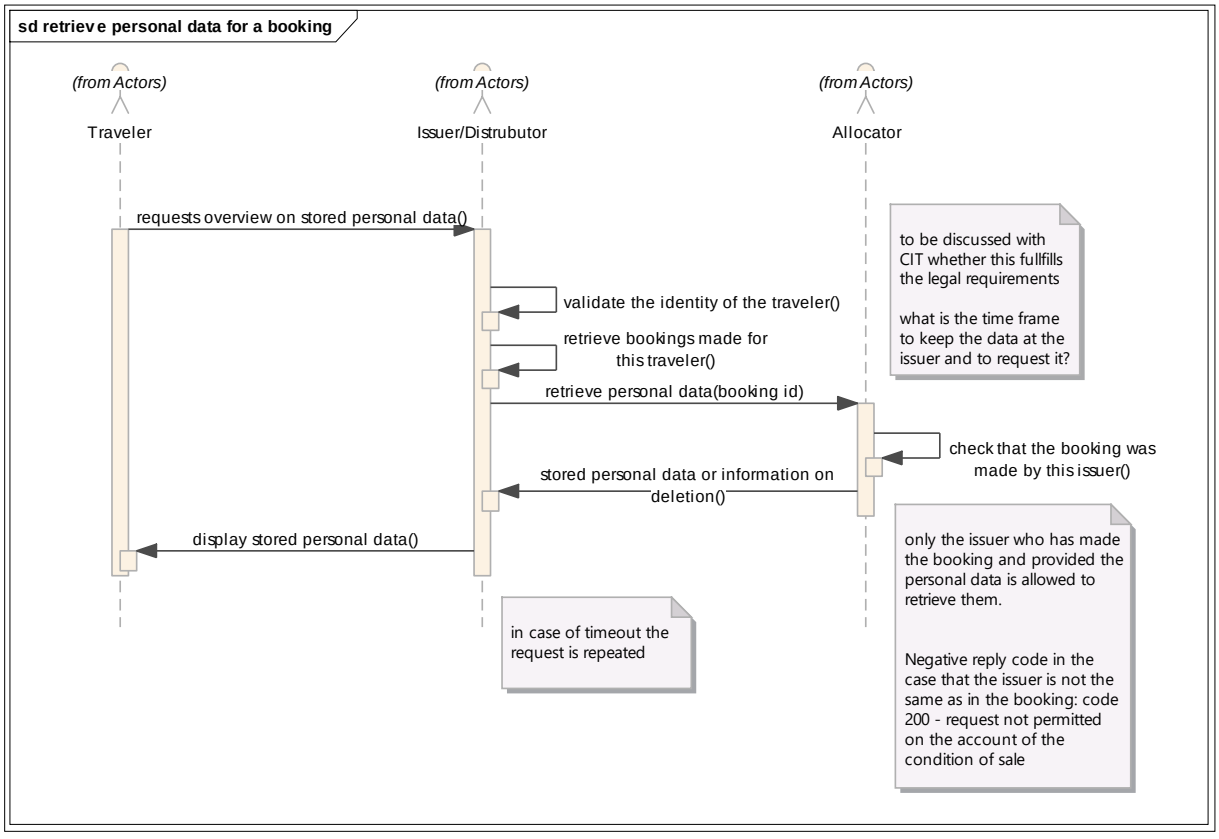
provided	Personal data initially provided
changed	Personal data changed

1.1.35.1 Scenarios - Retrieve stored personal data

The message provided allows the issuer to request the stored personal data to the passenger who booked the ticket through his system. The message provides access to the personal data stored for this booking. These data might be different from the data the issuer has provided as some data might have been deleted already.

The identification of the passenger must be done by the issuer.

In case of a timeout error the request can be repeated.



1.1.36 Exchange

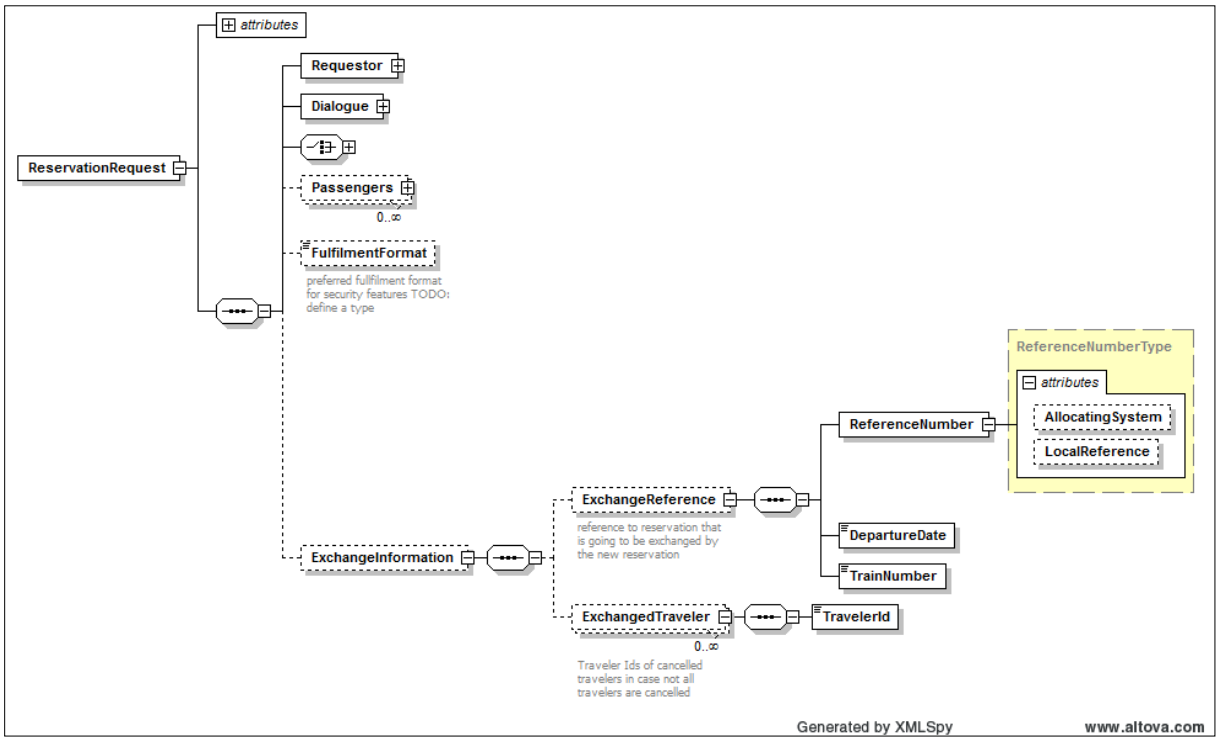
The exchange of a reservation is currently done via a new booking and a cancellation indicating the reason for cancellation “exchange”.

To allow personal data to be kept and validated in an exchange the cancellation of the old reservation and the booking of the new reservation need to be linked. The exchange information includes:

- The reference of the old reservation
- The passenger-Ids in case not all passengers are exchanged

The allocation system will copy the personal data from the original booking.

The allocating might mark the old reservation as “to be cancelled” to control exchanges.



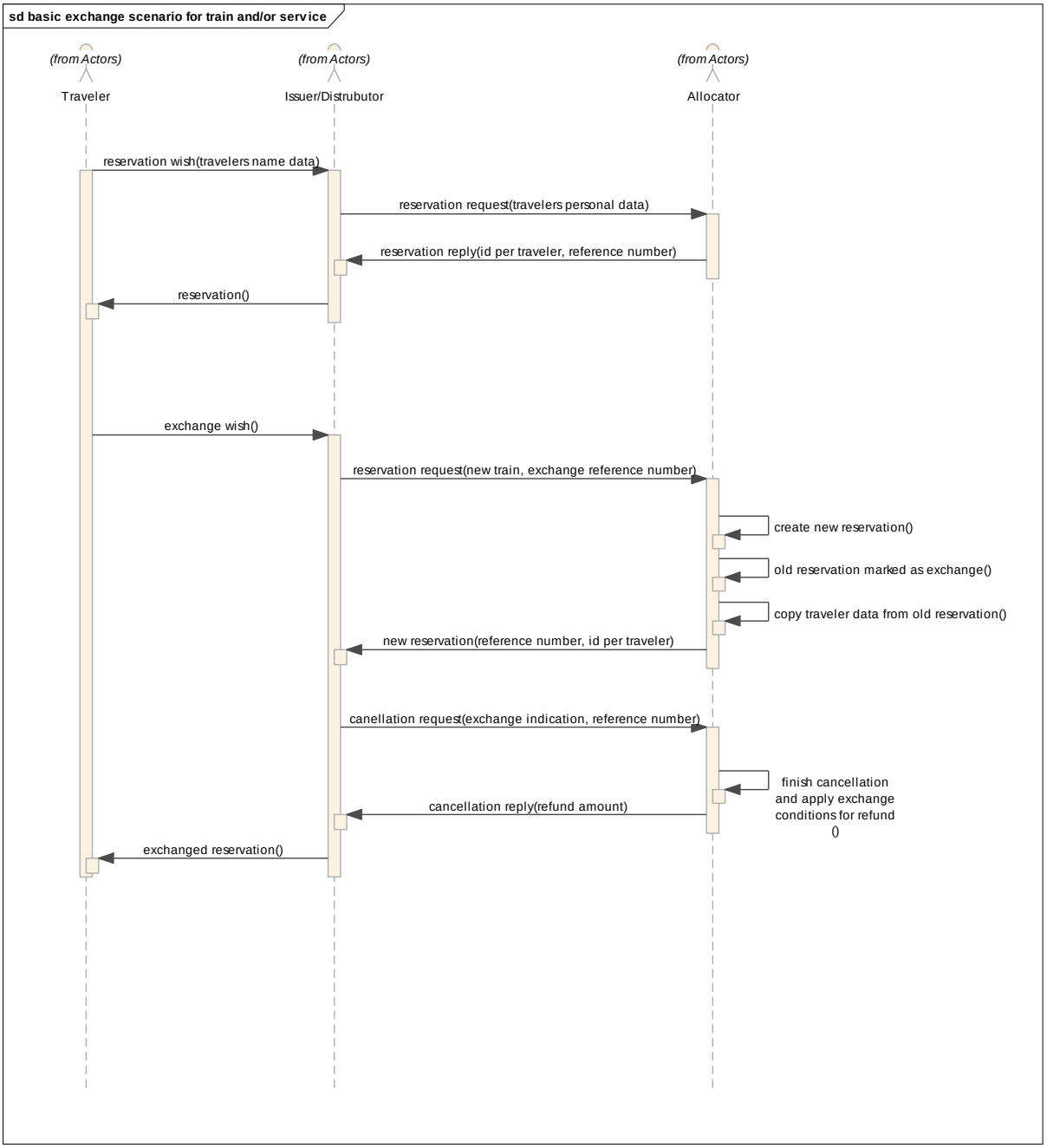
1.1.37 Scenarios -Exchange

The following scenarios are included:

- Exchange without errors
- Exchange with an error in the booking of the new reservation
- Exchange with an error in the exchange reference to the old booking
- Exchange with a missing “reason for cancellation – exchange” in the cancellation request.
  - Version 1 → negative reply
  - Version 2 → reason “exchange” is assumed
- Timeout error in the cancellation transaction
- Timeout error in the reservation transaction
- Duplicate requests for an exchange

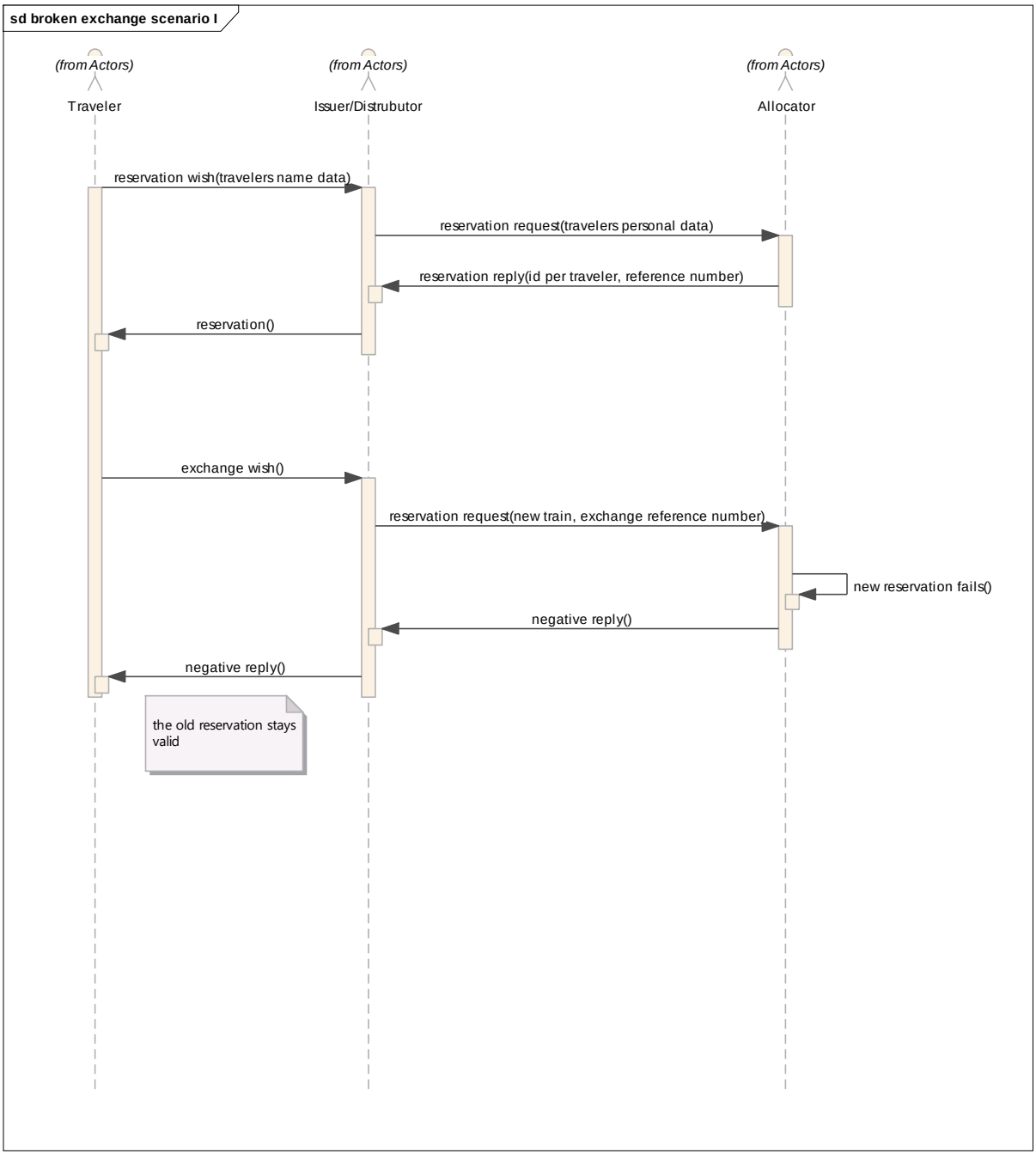
1.1.37.1 Exchange a reservation:

The issuing railway will first request the new reservation with a reference to the original reservation. The allocating railway will copy the passenger data from the original reservation. The issuing railway will cancel the original reservation in case the new reservation was successfully booked. The reason for cancellation will indicate “exchange”.



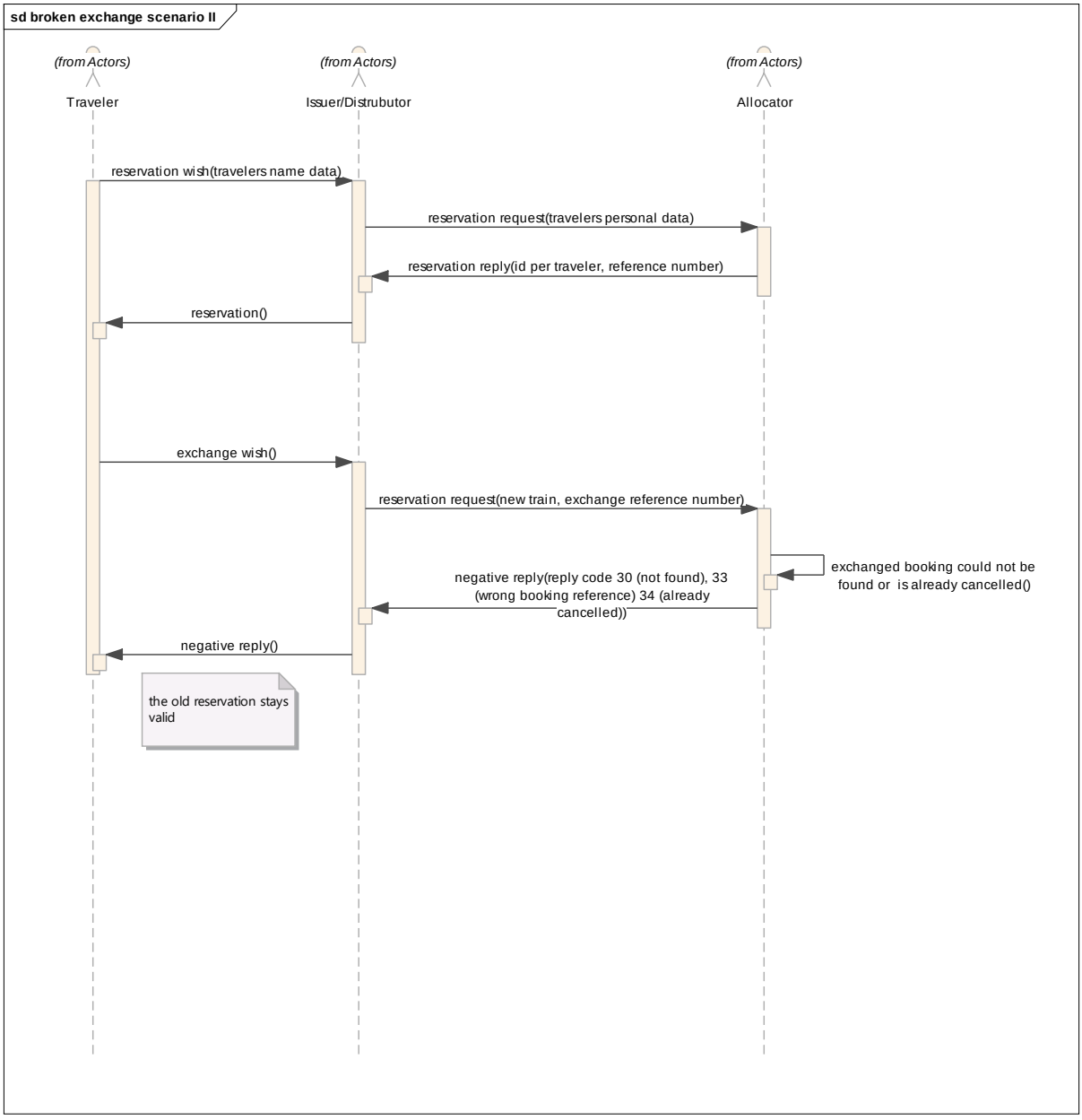
1.1.37.2 Error scenario: new reservation fails:

The issuing railway will first request the new reservation with a reference to the original reservation. The allocating railway will copy the passenger data from the original reservation. In case the new reservation fails the original reservation is still valid.



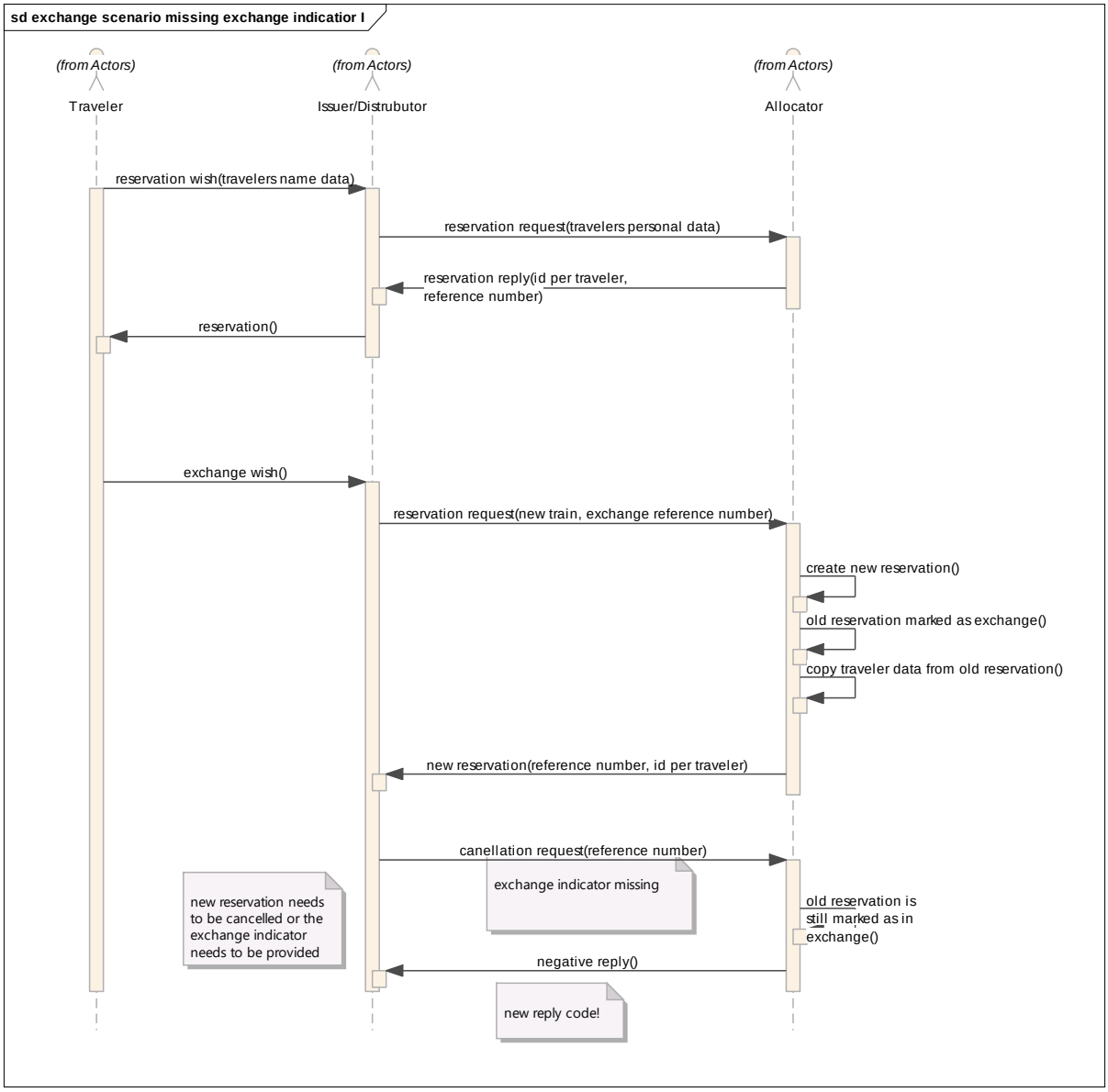
1.1.37.3 Error scenario: wrong booking reference in the request

In case a reference to an old reservation is provided in a reservation request and the old reservation cannot be retrieved or is already cancelled a negative reply is returned.



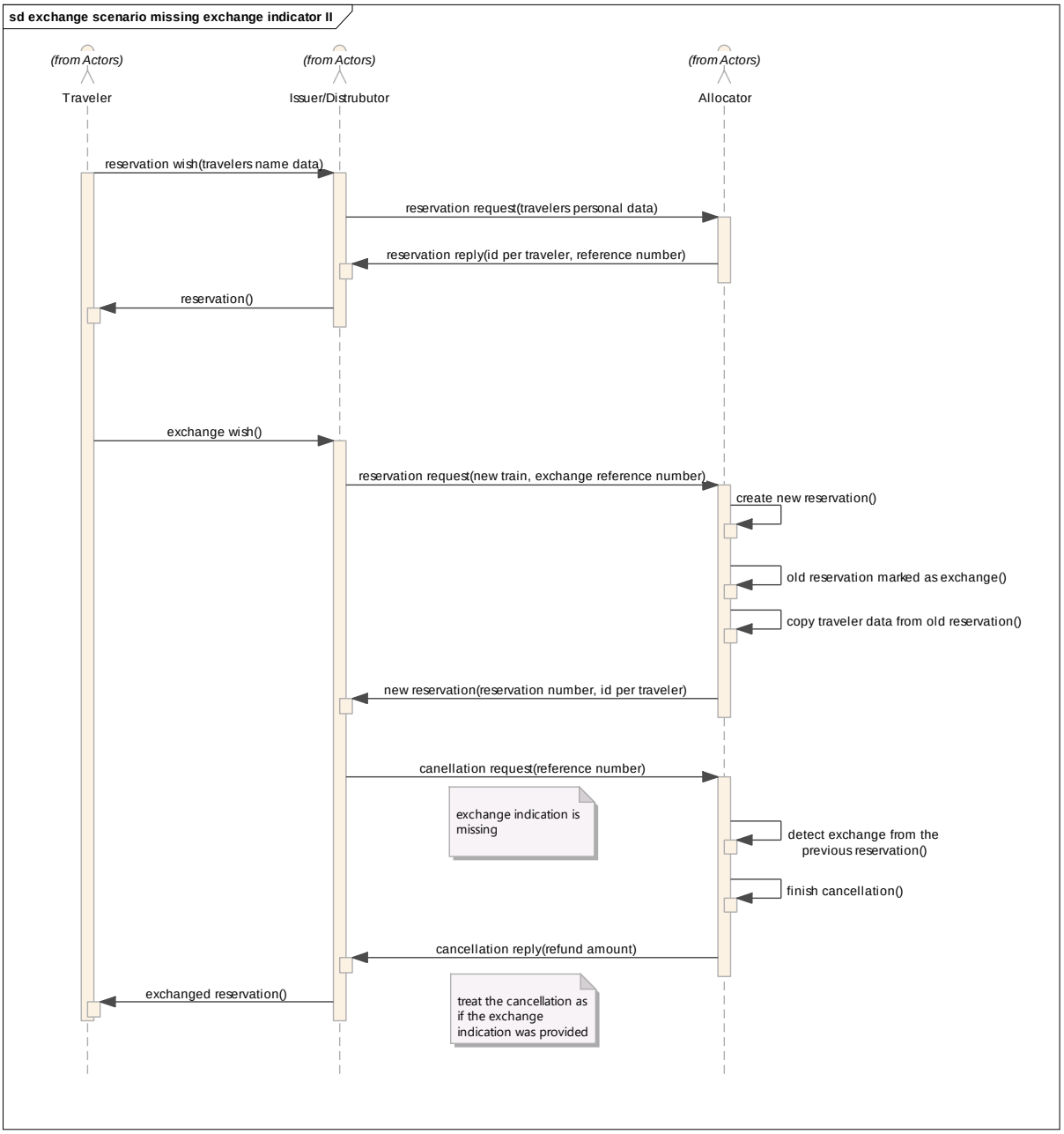
1.1.37.4 Error scenario: missing exchange indicator – version 1

In case the reason for exchange is missing but the allocating system already knows that there is a new reservation to replace this one the answer is a negative reply.



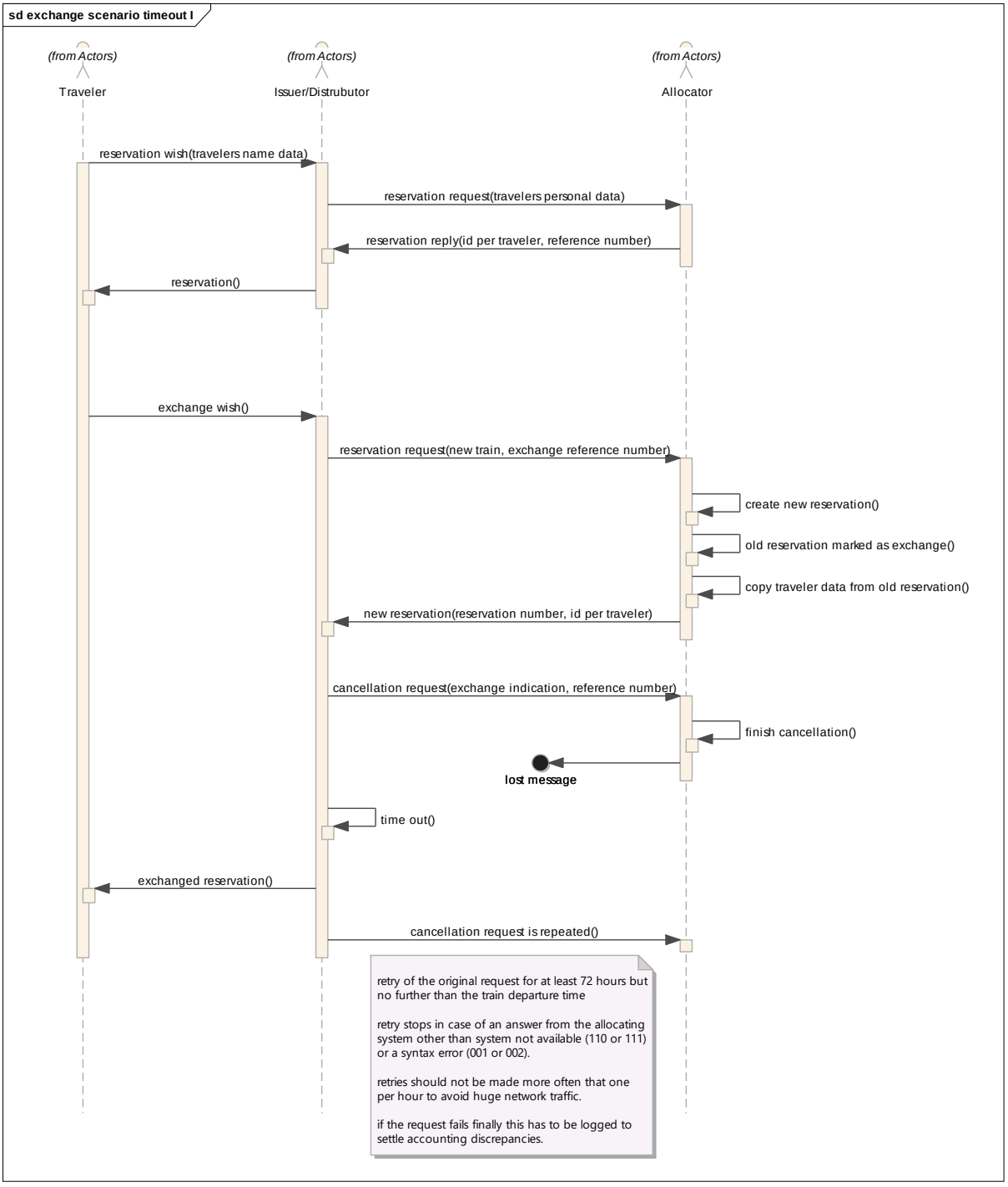
1.1.37.5 Error scenario: missing exchange indicator – version 2

In case the reason for exchange is missing but the allocating system already knows that there is a new reservation to replace this one the cancellation is processed taking the reason “exchange” into account.



1.1.37.6 Error scenario - Time out in cancellation part

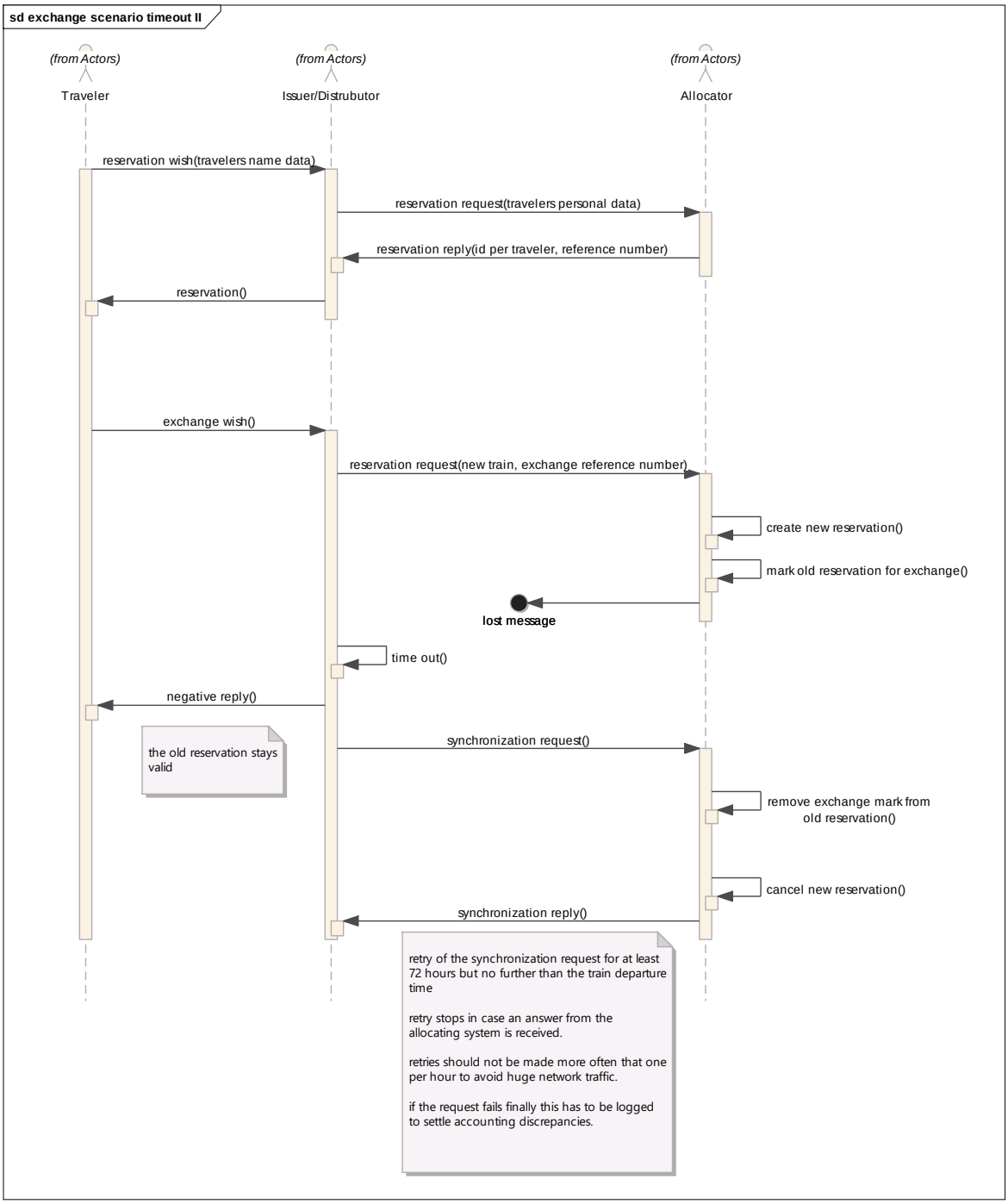
If a timeout error occurs in the cancellation part the request has to be repeated following the general rules on cancellation requests.



1.1.37.7 Error scenario - Time out in reservation part

In case of a timeout in the reservation request for the new reservation a synchronization request for this dialog has to be sent following the general rules for reservations. The synchronization request needs to be repeated in case the time out occurs also for the synchronization request.

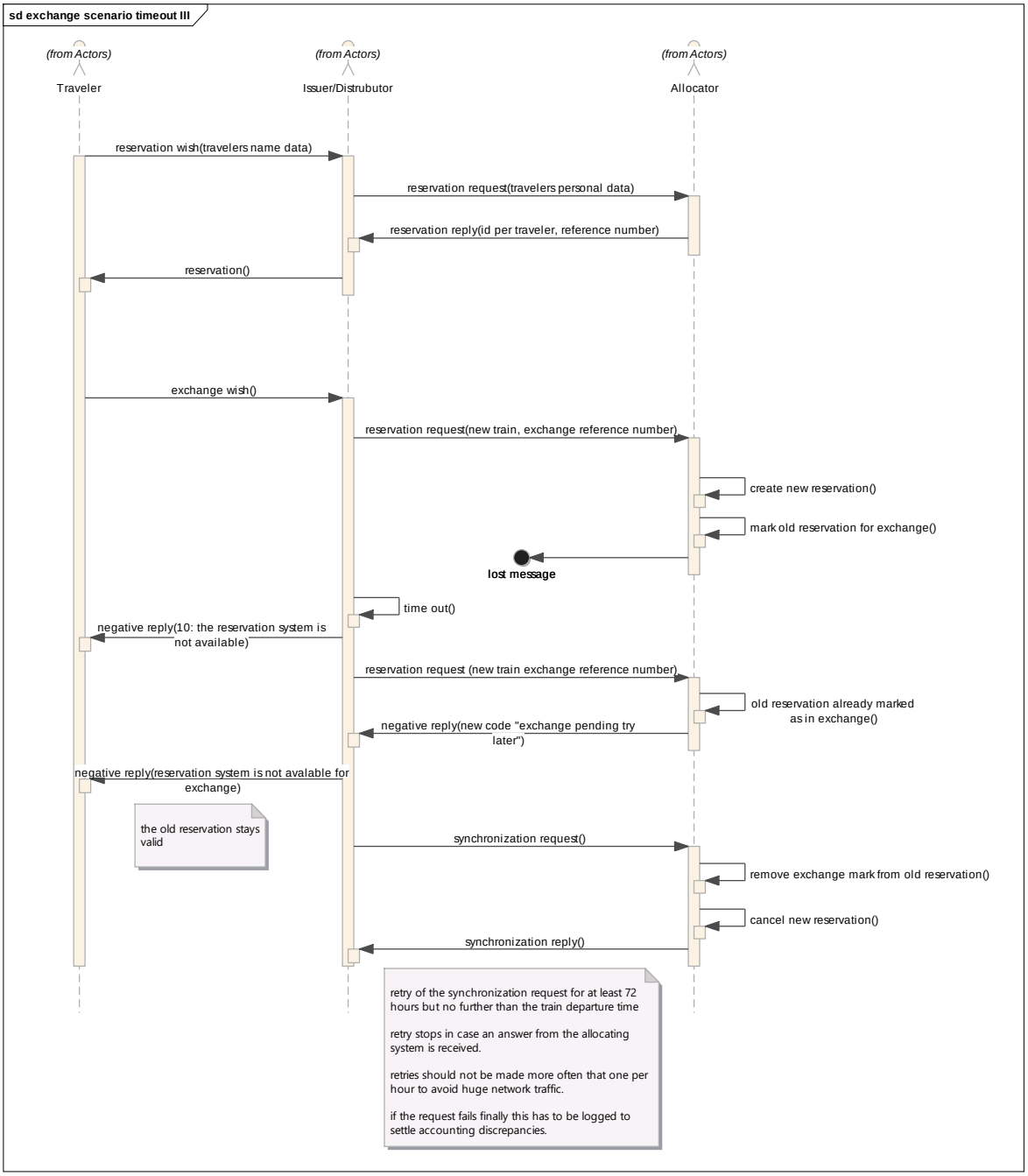
In case the allocating system has marked the old reservation as foreseen for exchange this mark needs to be removed.



1.1.37.8 Error scenario: duplicate exchange reservation request

It should be avoided that one reservation is used as exchange reference multiple times. In case of a reservation request with an exchange reference for a reservation that was already foreseen for exchange an error reply is given. The issuer needs to remove the previous reservation via a synchronization request or a cancellation request first before he can try another exchange.

In case exchange of one reservation into multiple reservations should be allowed the allocating railway has to implement more complex rules to cover these cases.



2 Translation rules for XML to Binary messages

Binary <-> XML translation rules:

A translator is in the role of a processor of personal data as defined in the EU data security regulation and has to fulfill the requirements of this regulation. CIT provides a guideline on CIT-RAIL.ORG.

In case a translation service is used it is recommended to use URL shortening to avoid problems with the limited data length of binary messages. The extensions in the negative reply message (indication on missing personal data) will not be translated in binary format. After each transaction the translator will delete the personal data.

Binary element	XML tag	translation
FulfillmentMedium	FulfillmentMedium	Code translation to 1 digit code: A - "RCT2" security feature for secure paper RCT2 B - "RCCST" security feature for secure paper RCCST C - "paper" security feature for blank paper D - “phone" security feature for smart phone E - "noMedium" travelling with an Id or Card (SIS Security in System)
PassengerData.FirstName	From XML to binary: FirstNameICAO if present FirstName otherwise From Binary to XML: the name is filled into FirstNameICAO	Copy / ICAO transliteration
PassengerData.LastName	From XML to binary: LastNameICAO if present LastName otherwise From binary to XML: The name is filled into LastNameICAO	Copy / ICAO transliteration
PassengerData.DateOfBirth	DateOfBirth	Date to DDDYYYY
PassengerData.CountryOfBirth	CountryOfBirth	copy
E-Mail	Email	copy
passengerId	passengerId	copy
ControlId	ControlId	copy
URL type	DownloadDocumentType	A = pdf B = any
URL	TicketLink	copy
Exchange Reference.reference	ExchangeReference.	copy

	RererenceNumber	
Exchange Reference.train	ExchangeReference. TrainNumber	copy
Exchange Reference.date	ExchangeReference. DepartureDate	Date to DDDYYYY

3 Coding the message elements "Reservation"

Code Lists used in the binary messages are used for the XML messages as well.

4 Coding the message elements XML only

Graphic item

Intentionally empty

FulfillmentMedium

Medium for issuing a ticket. Different Medium might have different restrictions on the content due to size limitations.

- "RCT2" secure paper RCT
- "RCCST" secure paper RCCST
- "paper" blank A4 paper
- “phone" smart phone
- "nomedium" travelling with a name, an Id or Card

FeatureType

Type of a security feature provided as binary data

The FeatureType indicates the type of a security feature and the format in which the data are provided:

- "rawBc" binary data too be included in an bar code
  The base64 encoded byte raw data to be included in an aztec bar code. This includes the data of the ticket and the signature in case the bar code is signed. It does not include the any high level encoding of the bar code (aztec encoding).
- "matrixBc" binary data of the black and white pixel matrix of a square bar code
  A base64 encoded bit-array containing a bit for each square of a bar code. The number of bits is the number of black and white squares in the bar code. The data are padded to full octets for a byte array. The bits start in the upper left corner of the bar code.
- "pngBc" png image data of a bar code
  A base64 encoded byte array containing the image formatted as png (portable network grapgic)
- "jpgBc" jpg data of a bar code
  A base64 encoded byte array containing the image of a bar code formatted as jpg
- "pngVe" png image data of a visual element

A base64 encoded byte array containing the image of a visual security element code formatted as png.

- "jpgVe" jpg data of a visual element
  A base64 encoded byte array containing the image of a visual security element code formatted as jpg.
- "gifVe" jpg data of a visual element
  A base64 encoded byte array containing the image of a visual security element code formatted as gif. Animated gif images can be used on smartphones.

FeatureLinkType

The type of a security feature to be downloaded via a link (URI).

- "visual element" download of visual security element (formats jpg, png, gif)
- "barcode" download of barcode as image (formats jpg, png)

SocialMediaAccount.type

Type of the social media account provided:

- facebook
- whatsapp
- skype
- wechat

URL Download Type:

Format of a document to be downloaded via an URL

- pdf (“A” in binary messages)
- any (“B” in binary messages)

A. Appendix A - Measures for communication protocols

A.1. Principles

Rules which are to be applied by the reservation system, if a message (request or reply) cannot be sent.

A.1.0. (empty for numbering preservation)

(intentionally empty)

A.1.1. Request message

- Original message = repetition of the request
- Correction = inputting into the litigation file (human readable text prepared for explanation of the problem)
- Synchronisation message = inputting of the request concerned into the litigation file.

A.1.1. Reply message

- to an original message
- Confirmation = internal cancellation
- Negative reply = nothing to be done
- to a correction request = nothing needs to be done
- to a synchronisation request = nothing to be done
- the rollback message in xml corresponds to the correction message in the binary format.

A.2. Exchange protocol using web services

A.2.0. General

This transmission protocol can be used in case of communication with a web service. It concerns only the requesting and replying applications. It is assumed, that the xml version of the messages is used.

The connection between the terminals and systems to which they are connected, are the exclusive responsibility of these systems.

A.3. (empty to preserve section numbering)

A.3.0. (empty to preserve section numbering)

A.3.1. Reservation Request Timeout

Situation:

The issuing system has sent a reservation request and did not receive a reply in time.

Reaction:

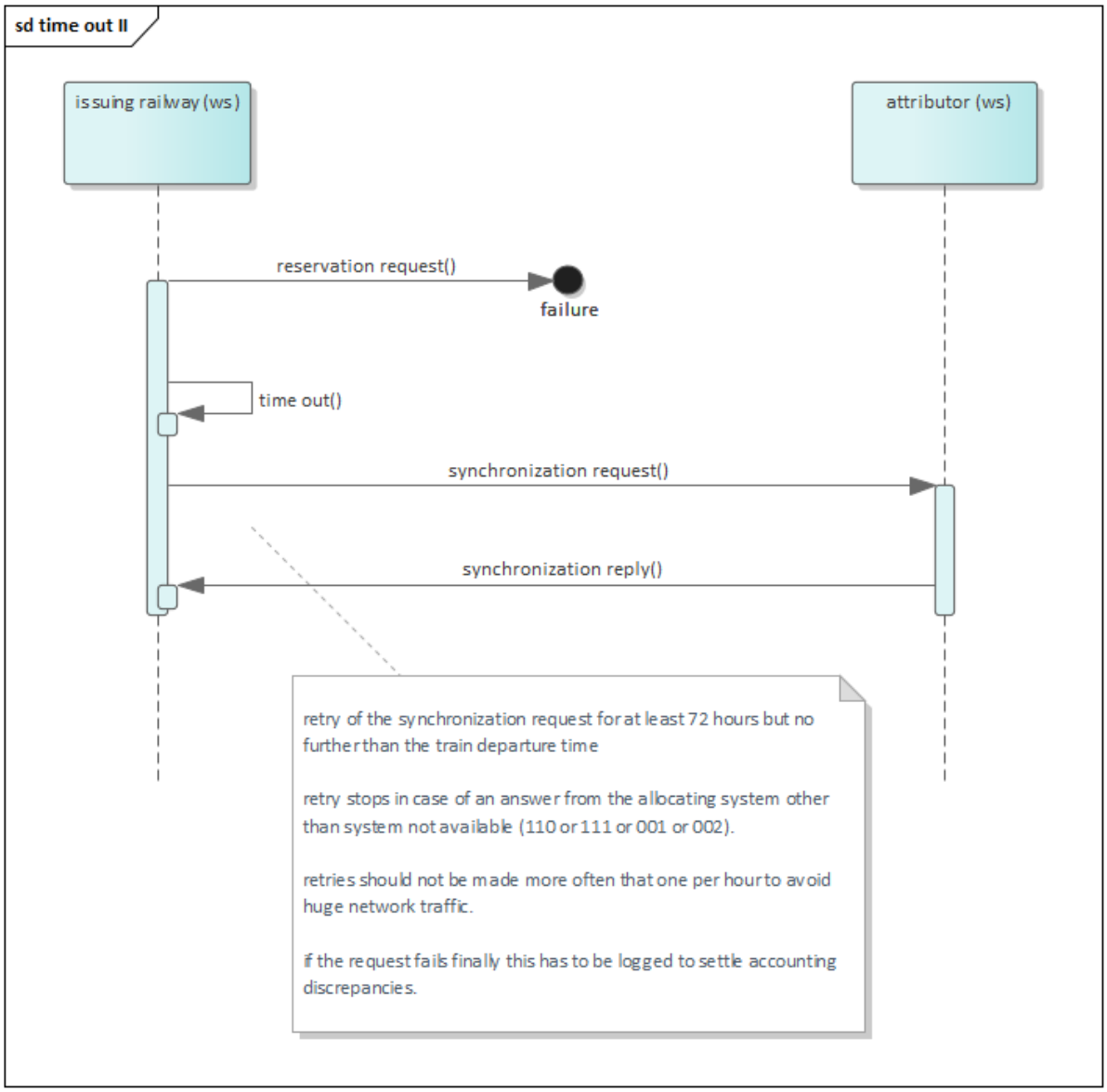
The issuing system sends a synchronization request and repeats this request until it is successful.

Responsibilities:

The issuing system is responsible to send the synchronization request(s).

The issuing system is responsible to send synchronization requests that identify a reservation request uniquely by date and dialogue number. It is not allowed to reuse a dialogue number that has been used for a reservation on that date except this reservation was already cancelled.

The allocation system is responsible to clean up any reservation that might have been made in case the issuing system sends the appropriate synchronization requests. The allocating railway must not account for this reservation.



A.3.2. Cancellation, Synchronization or Rollback Time Out

Situation:

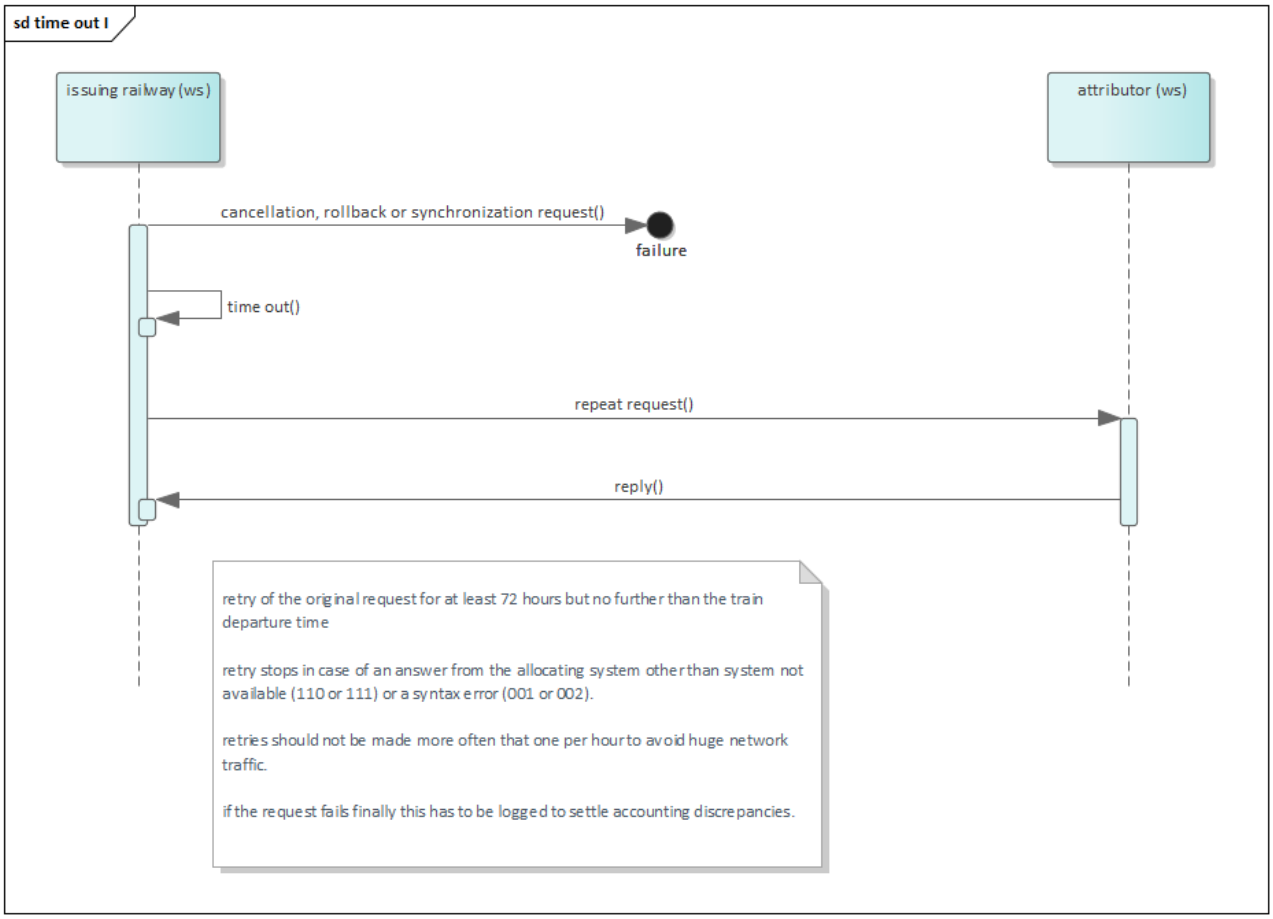
The issuing system has sent a cancellation, synchronization or rollback request and did not receive a reply in time.

Reaction:

The issuing system repeats the request until it is successful.

Responsibilities:

The issuing system is responsible to resend the request.



A.3.3. Information Request Time Out

Situation:

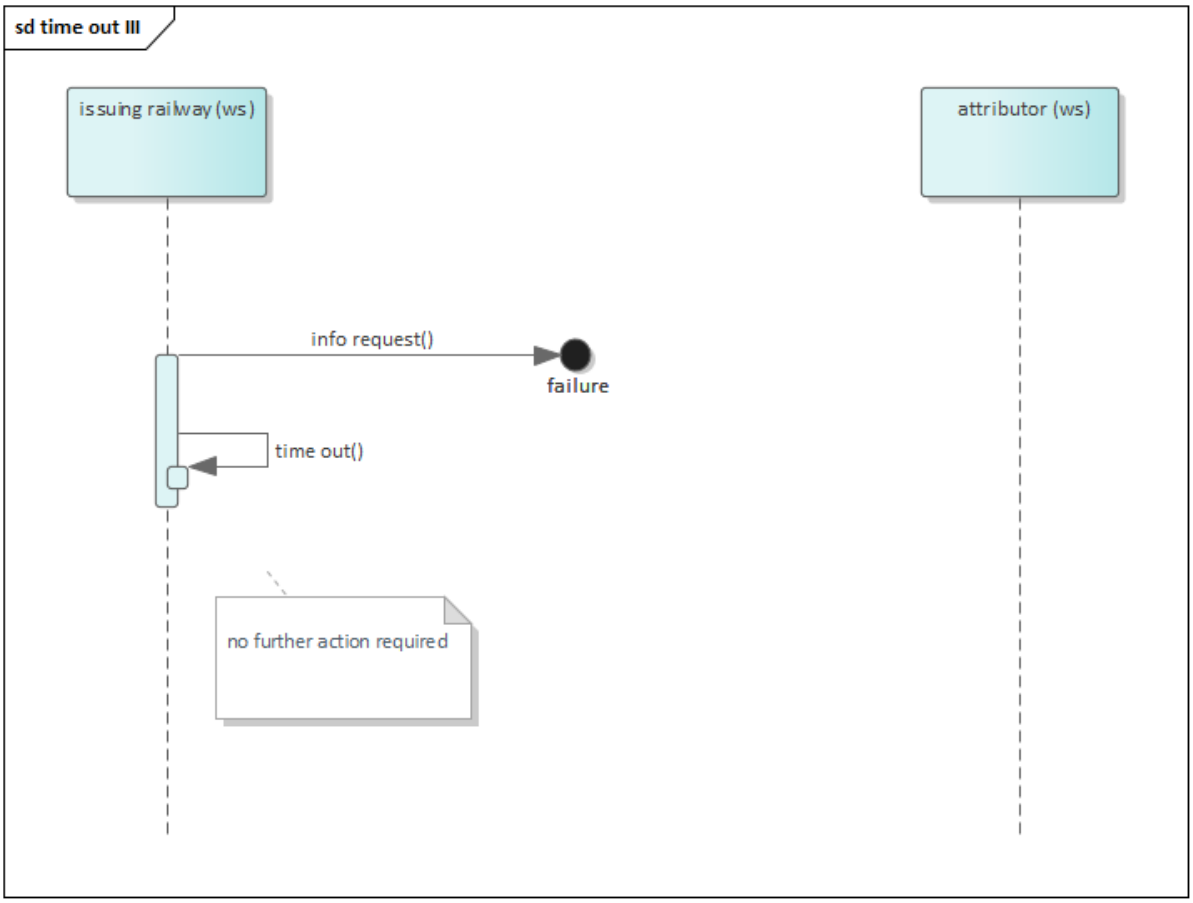
The issuing system has sent an information request (e.g. an availability request or a reservation info request) and did not receive a reply in time.

Reaction:

None.

Responsibilities:

None.



A.3.4. Reservation Request cannot be processed by allocating system

Situation:

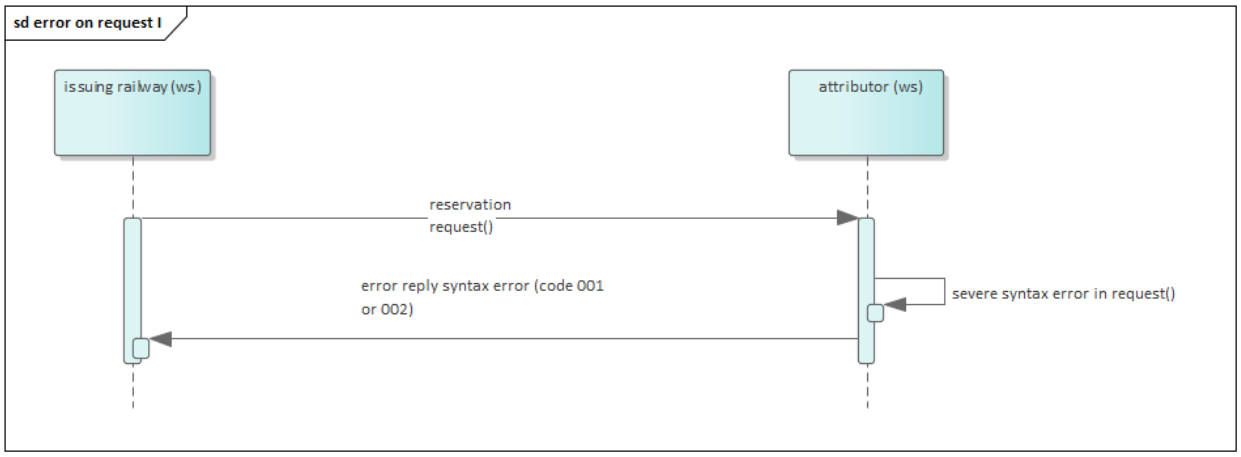
The issuing system has sent a reservation request and did receive a syntax error (code 001 or 002).

Reaction:

None.

Responsibilities:

The allocation system is responsible to clean up any reservation that might have been.



A.3.5. Cancellation, Synchronization or Rollback Request Syntax Error

Situation:

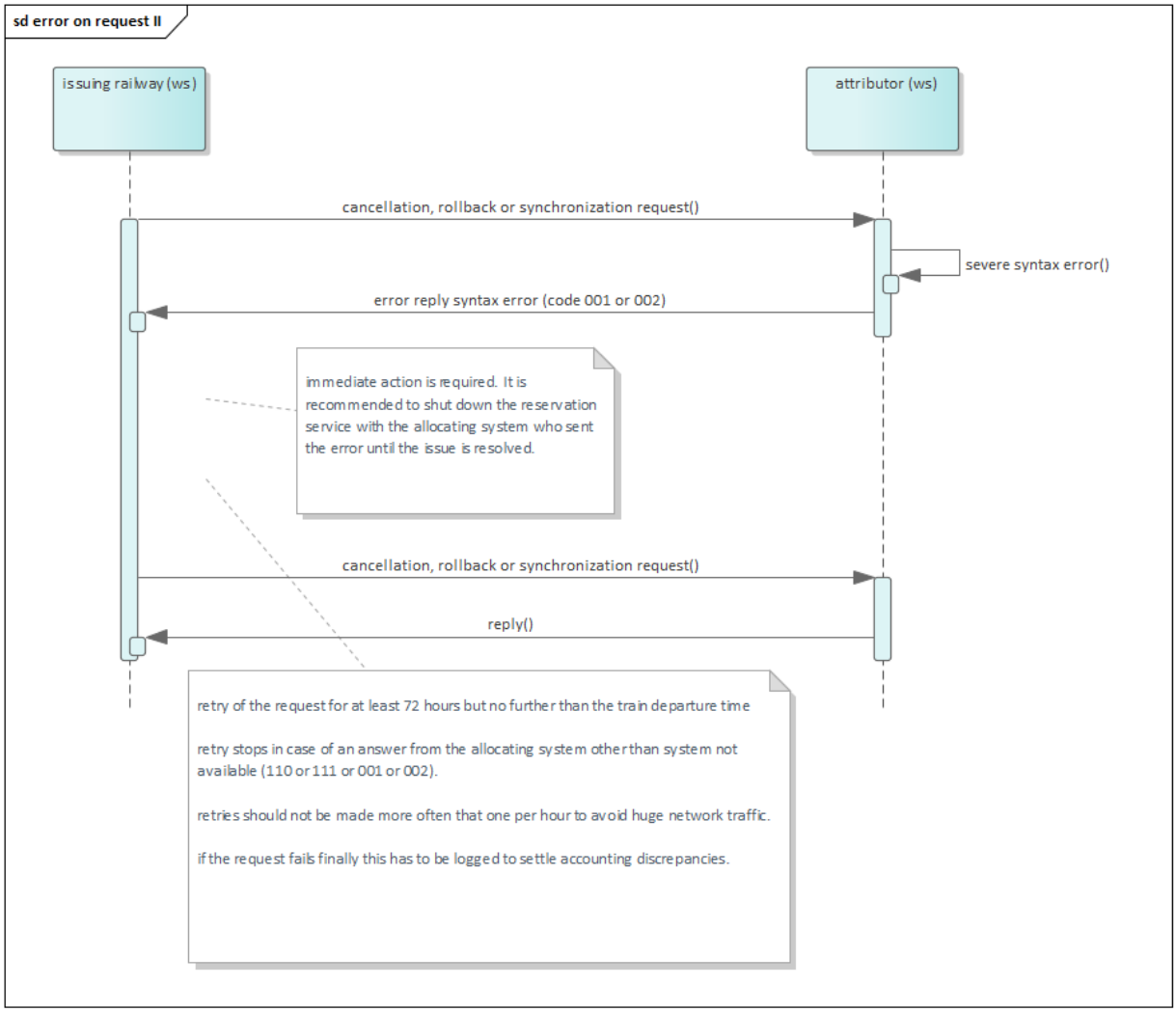
The issuing system has sent a cancellation, synchronization or rollback request and did receive a syntax error.

Reaction:

The issuing system repeats the request until it is successful. The issuing protocols the issue.

Responsibilities:

The issuing system is responsible to resend the request and to investigate the issue. The issuing system is responsible to close the reservation requests to the allocating system if the error cannot be corrected immediately. The allocating system might close the reservation service for this issuing system to prevent further damage.



A.3.6. Reservation Reply cannot be read by issuing system

Situation:

The issuing system has sent a reservation request and did receive a reply. An error occurred during the processing of the reply. The reply was not readable.

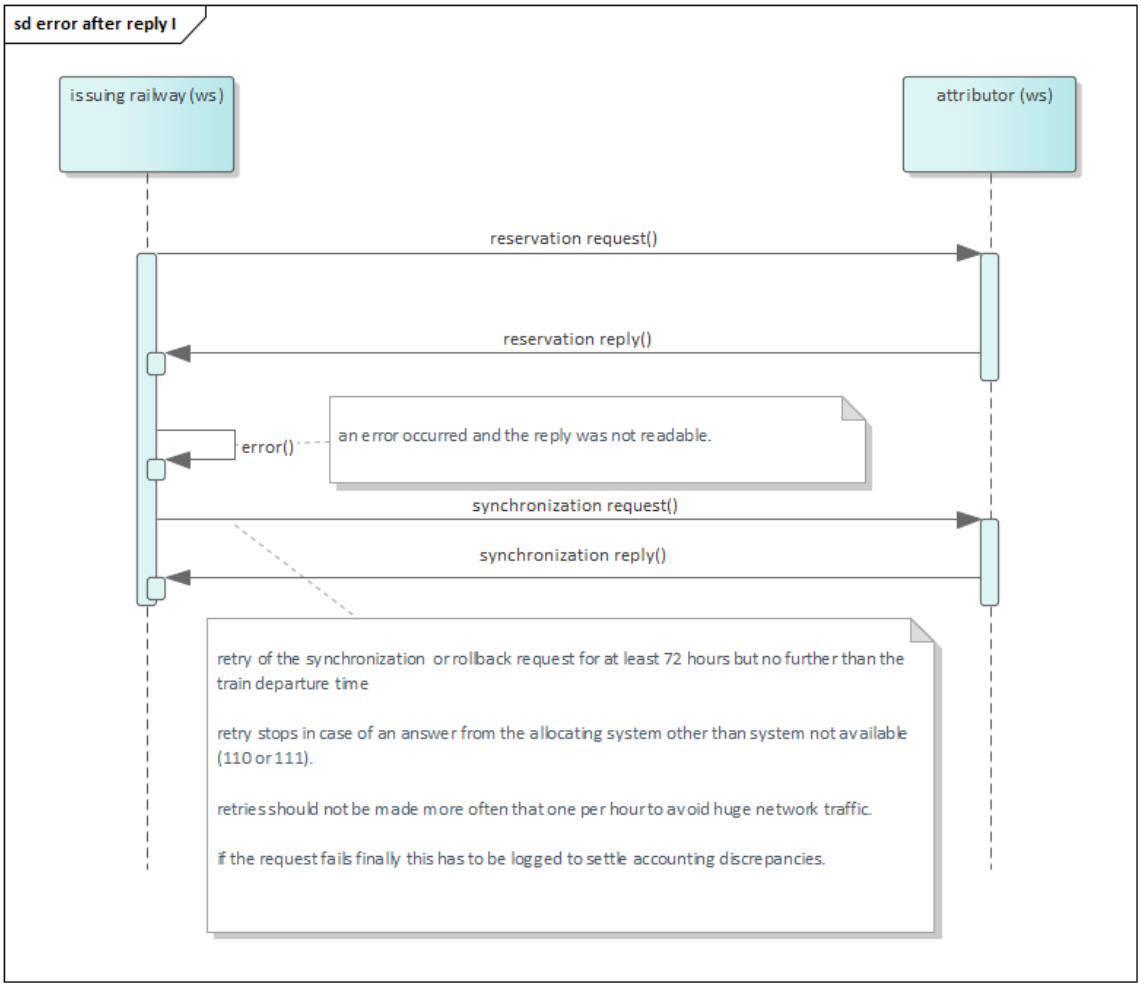
Reaction:

The issuing system sends a synchronization request. The synchronization request has to be repeated if it is not successful.

Responsibilities:

The issuing system is responsible to send the synchronization request.

The issuing system is responsible to send synchronization requests that identify a reservation request uniquely by date and dialogue number. It is not allowed to reuse a dialogue number that has been used for a reservation on that date except when this reservation was already successfully cancelled.



A.3.7. Reservation Reply cannot be processed by issuing system

Situation:

The issuing system has sent a reservation request and did receive a reply. An error occurred during the processing of the reply. The reservation reference number could be retrieved from the reply.

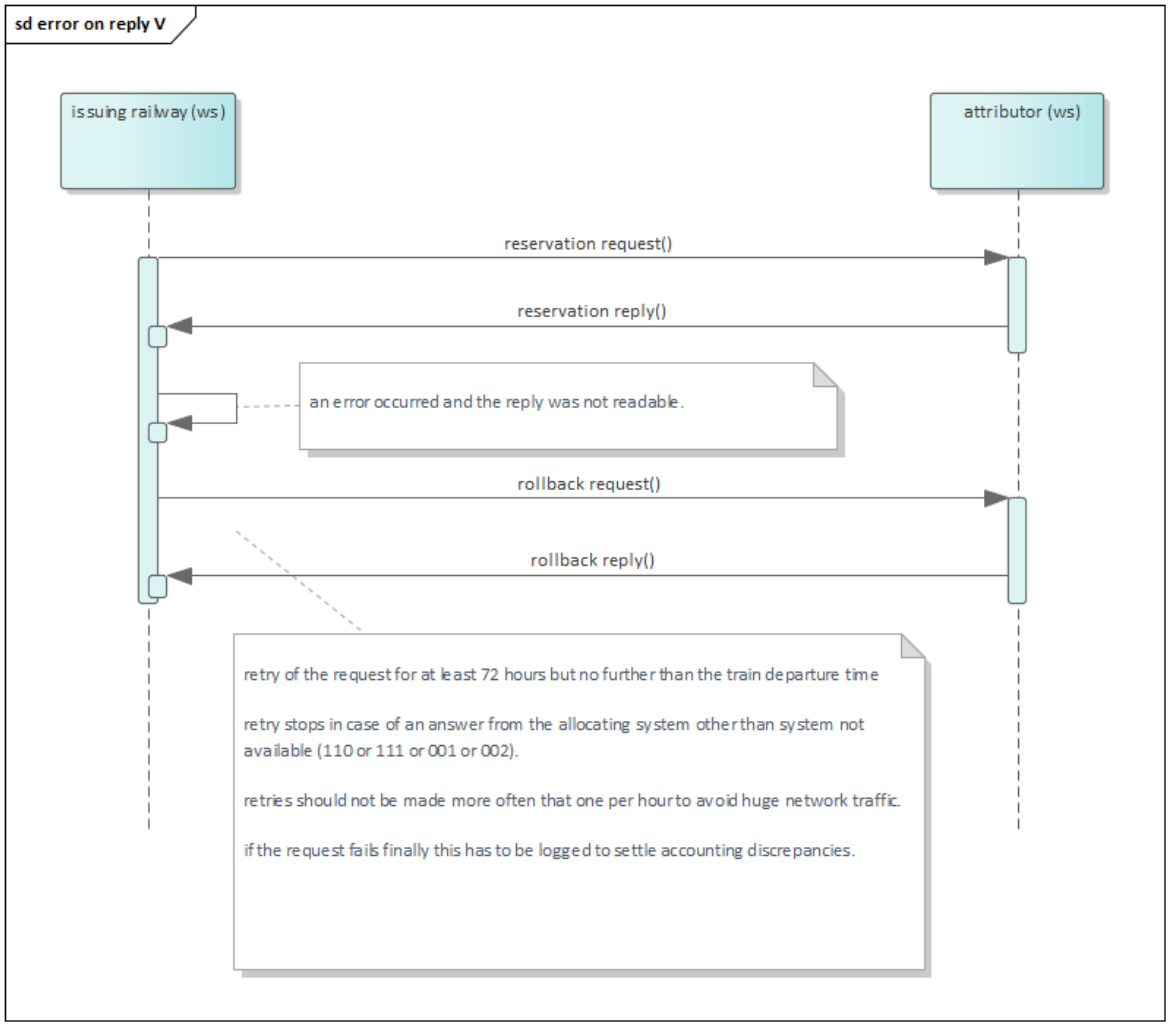
Reaction:

The issuing system sends a rollback request. The rollback request has to be repeated if it is not successful.

Responsibilities:

The issuing system is responsible to send the rollback request.

The allocating system must cancel the reservation if the issuing system sends the request properly.



A.3.8. Cancellation, Synchronization or Rollback Reply Error

Situation:

The issuing system has sent a cancellation, synchronization or rollback request and did receive a reply. An error occurred on processing the reply.

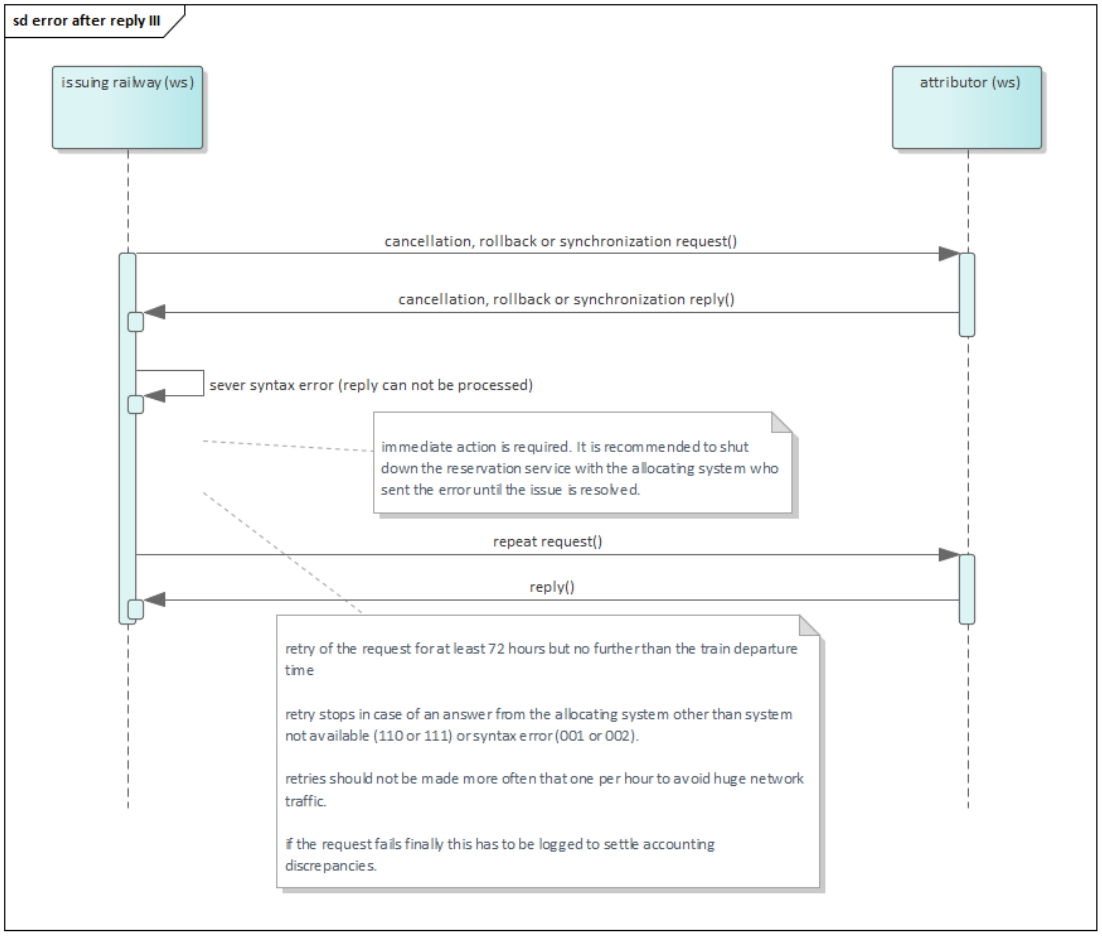
Reaction:

In case that the issuing system cannot decide whether the transaction was successful the issuing system repeats the request until it is successful. The issuing protocols the issue.

Responsibilities:

The issuing system is responsible to resend the request and to investigate the issue. The issuing system is responsible to close the reservation requests to the allocating system if the error cannot be corrected immediately.

The allocating system might close the reservation service for this issuing system to prevent further damage.



A.3.9. Information Request Error

Situation:

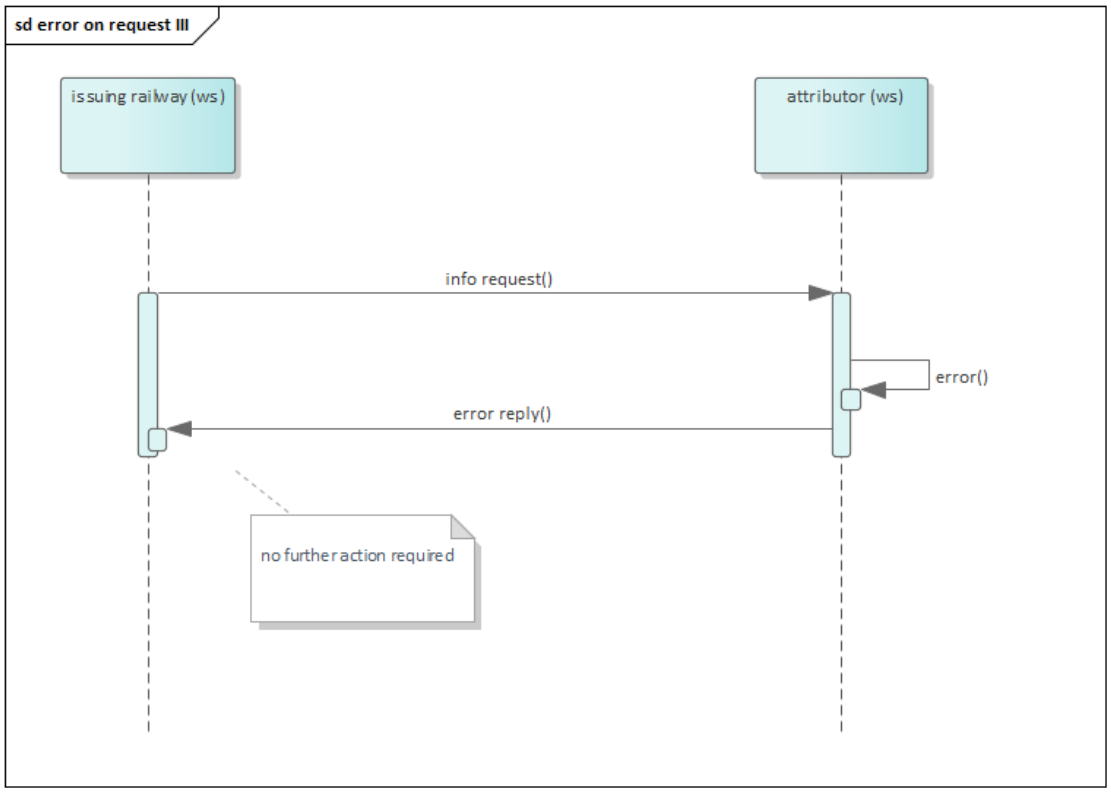
The issuing system has sent an information request (e.g. an availability request or a reservation info request) and did receive an error reply

Reaction:

None.

Responsibilities:

None.



A.3.10. Information Reply Error at the Issuing System

Situation:

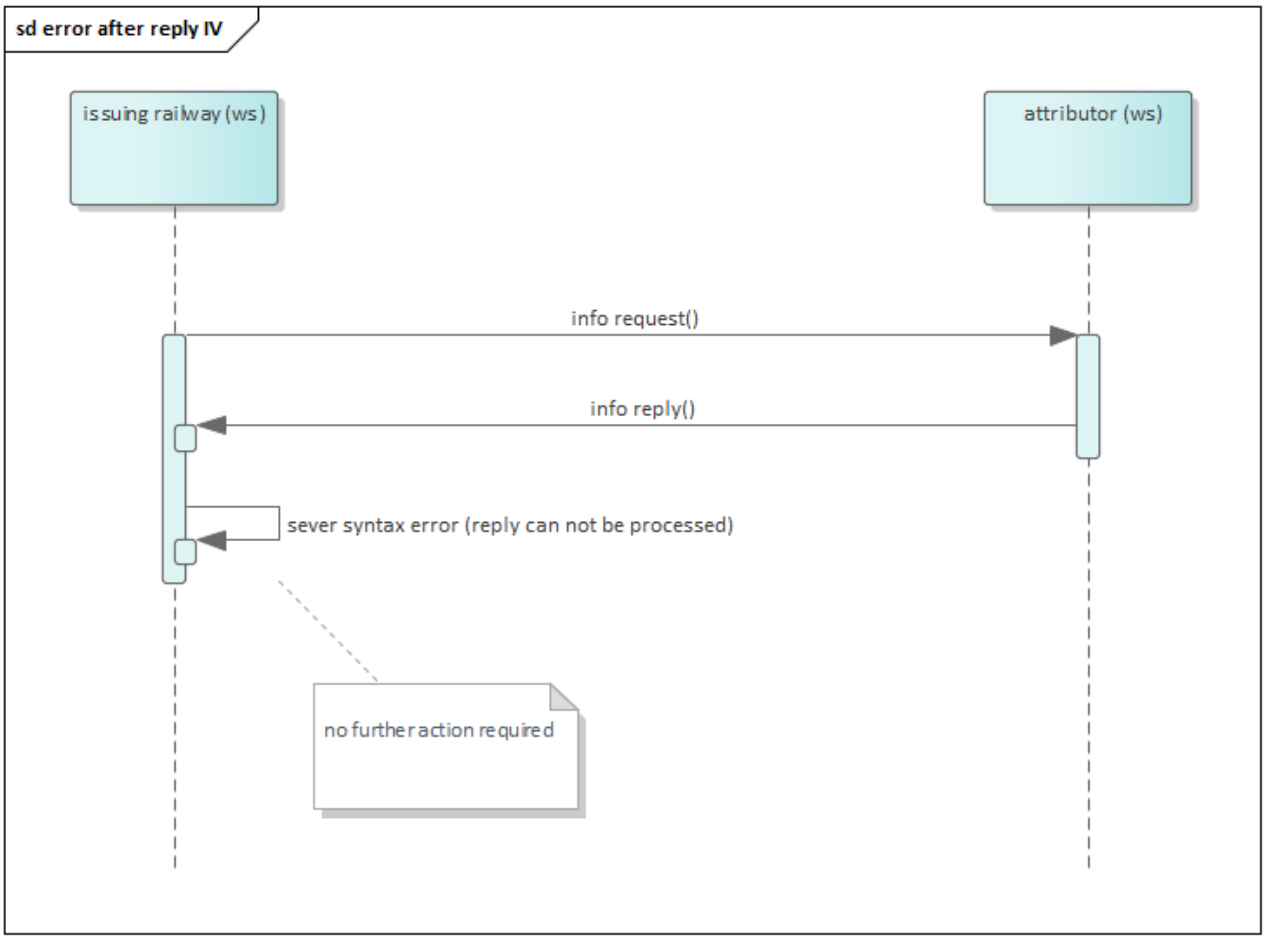
The issuing system has sent an information request (e.g. an availability request or a reservation info request) and cannot process the reply

Reaction:

None.

Responsibilities:

None.



A.4. Exchange protocol using mq binary to web services translator

A.4.0. General

This transmission protocol can be used in case of communication between mq-series and a web service using an intermediate translator. It concerns the requesting and replying applications and the translator. It is assumed, that the xml version of the messages is used by the web service and the binary messages are used in the issuing system.

The connection between the terminals and systems to which they are connected, are the exclusive responsibility of these systems.

A.4.1. A.4.1 – Translator cannot Translate Request

Situation:

The issuing system has sent a reservation request and the Translator cannot translate the request.

Reaction:

The translator must send syntax error reply 001 or 002 if technically possible.

In case of reservation requests and info requests (e.g. availability and reservation info request) the issuing system can ignore the error. In case of a cancellation, synchronization or correction request the issuing system should shut down the reservation service with the translator.

In case the data element size for personal data of a binary request message is exceeded the translator will:

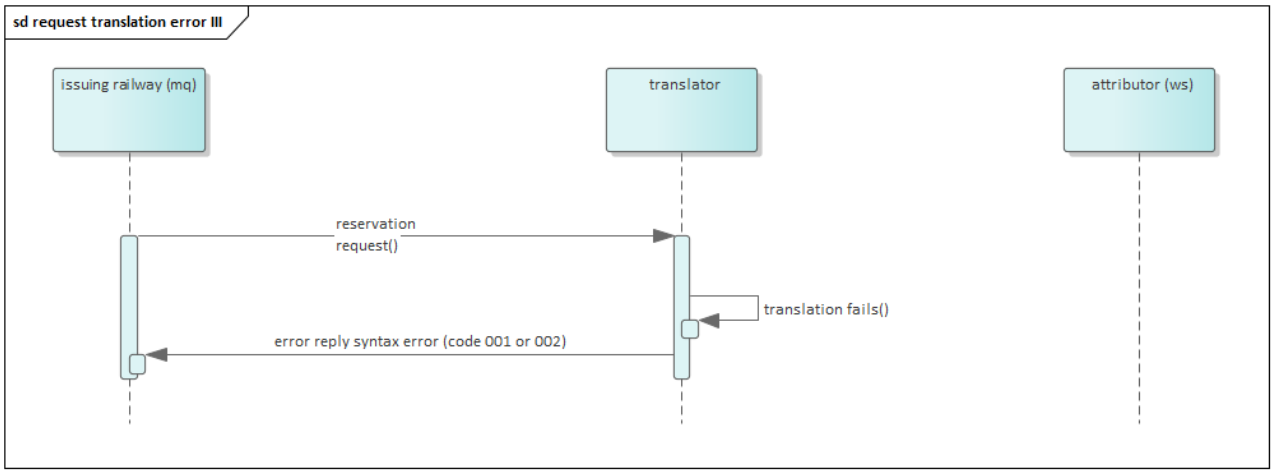
- return an error message (new error code 106 – personal data too long for translation)

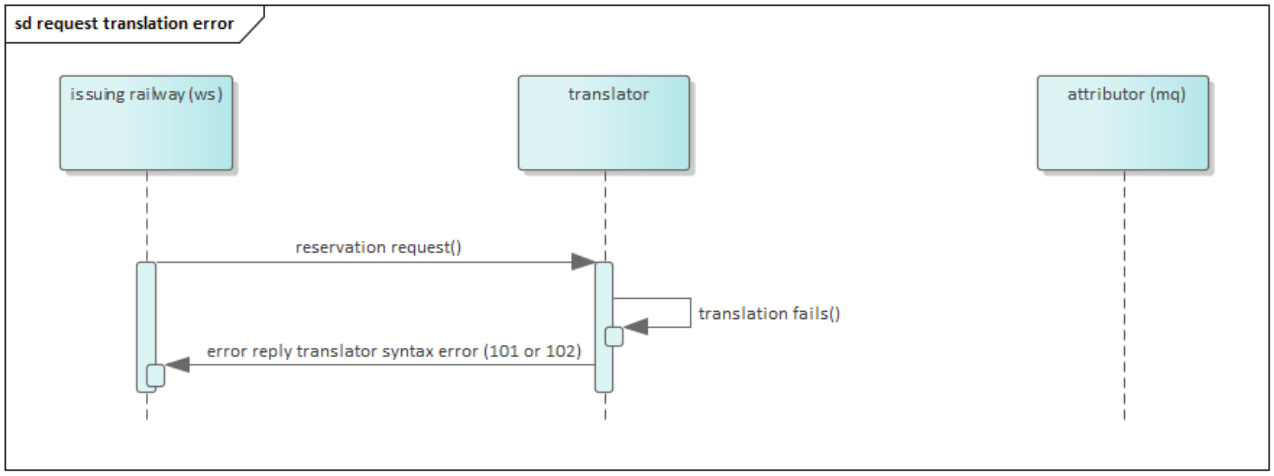
In case the data element size of a binary reply message is exceeded the translator will follow exactely the existing scenario for a failed translation of the reply:

- the translator does not send a reply;
- the issuer will send a synchronization request as he does not receive a reply.

Responsibilities:

The issuing system is responsible to close the connection to the translator.


sd request translation error III
issuing railway (mq)
translator
attributor (ws)
reservation
request()
translation fails()
error reply syntax error (code 001 or 002)


sd request translation error
issuing railway (ws)
translator
attributor (mq)
reservation request()
translation fails()
error reply translator syntax error (101 or 102)

A.4.2. Reservation Request Timeout

Situation:

The issuing system has sent a reservation request and did not receive a reply in time.

Reaction:

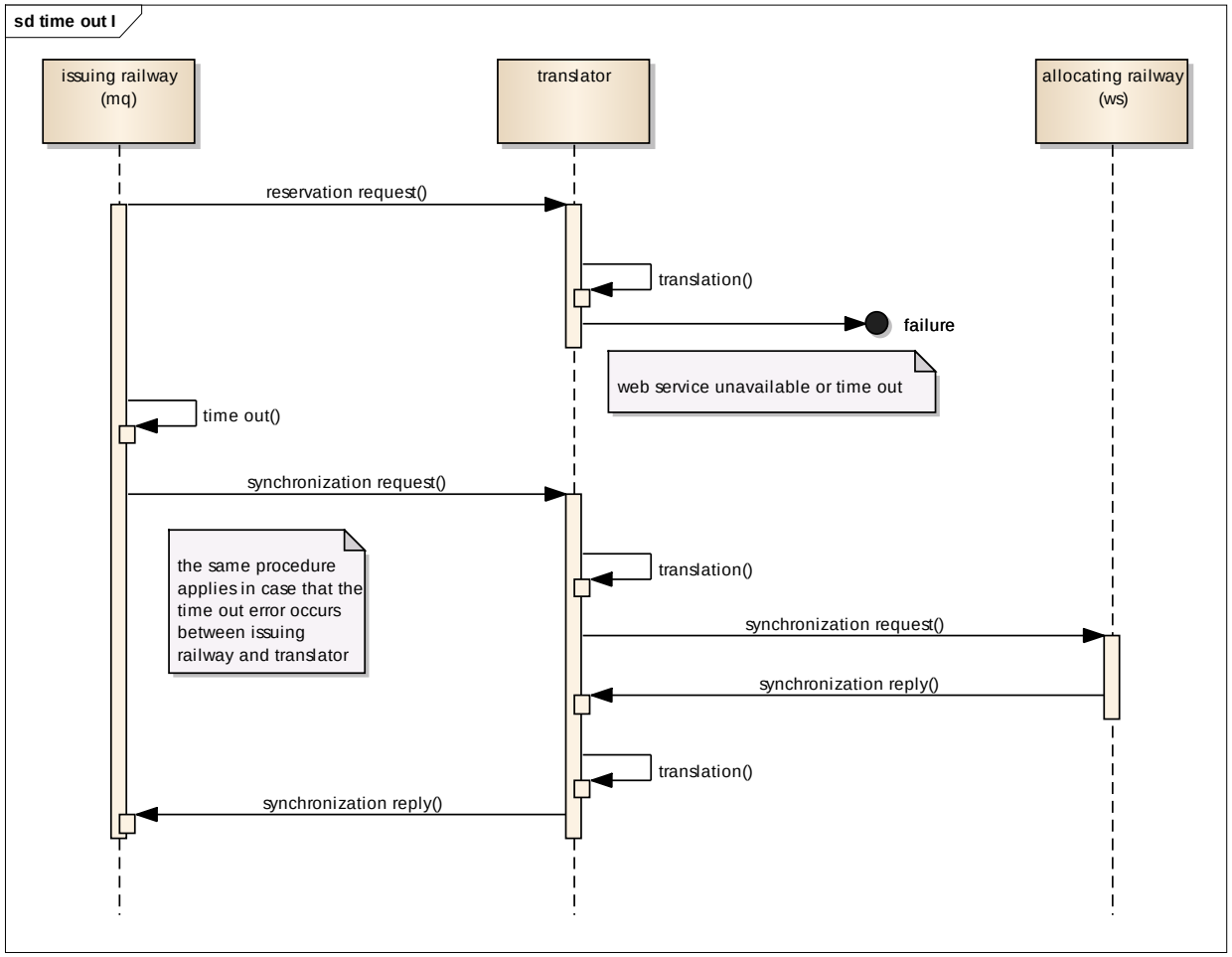
The issuing system sends a synchronization request and repeats this request until it is successful.

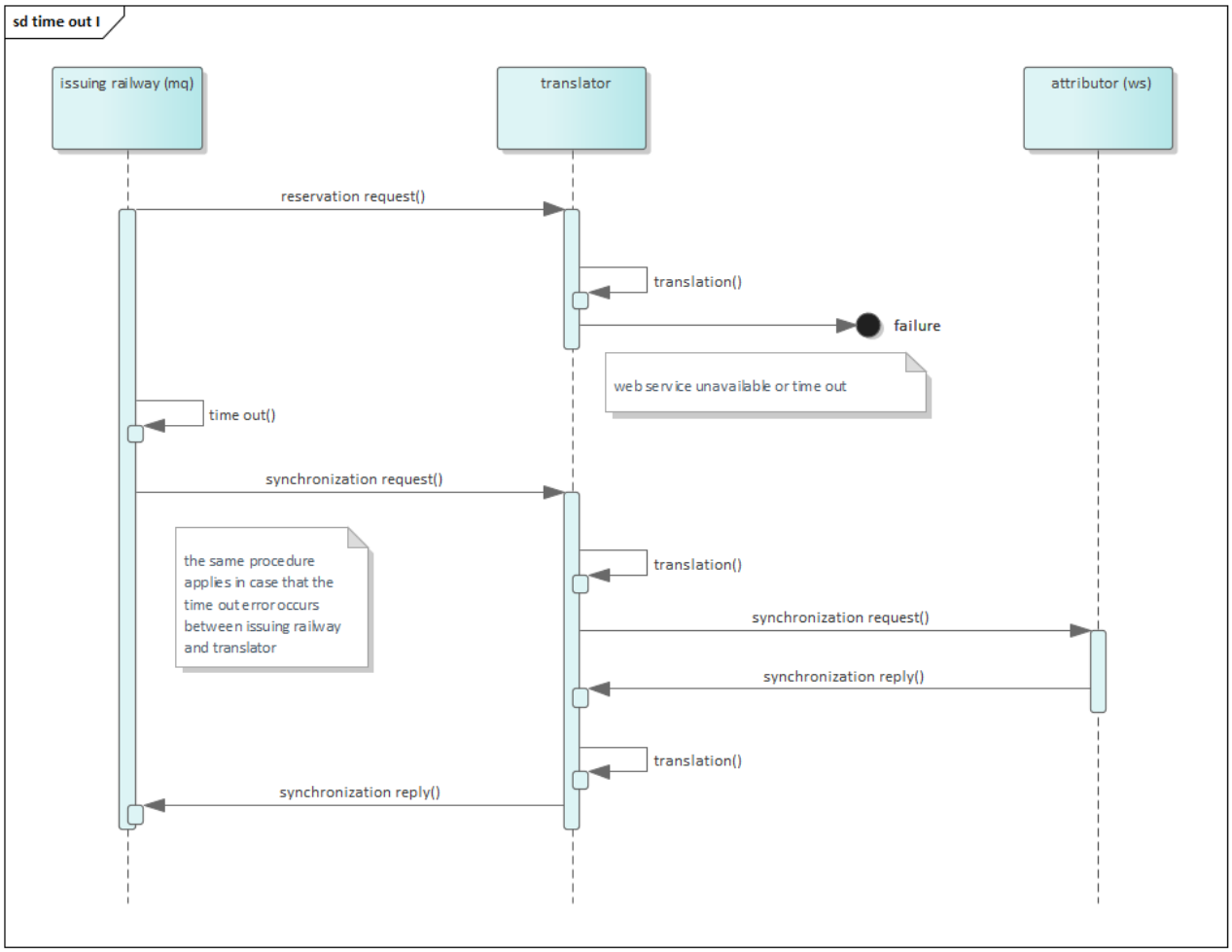
The translator shall not send a reply.

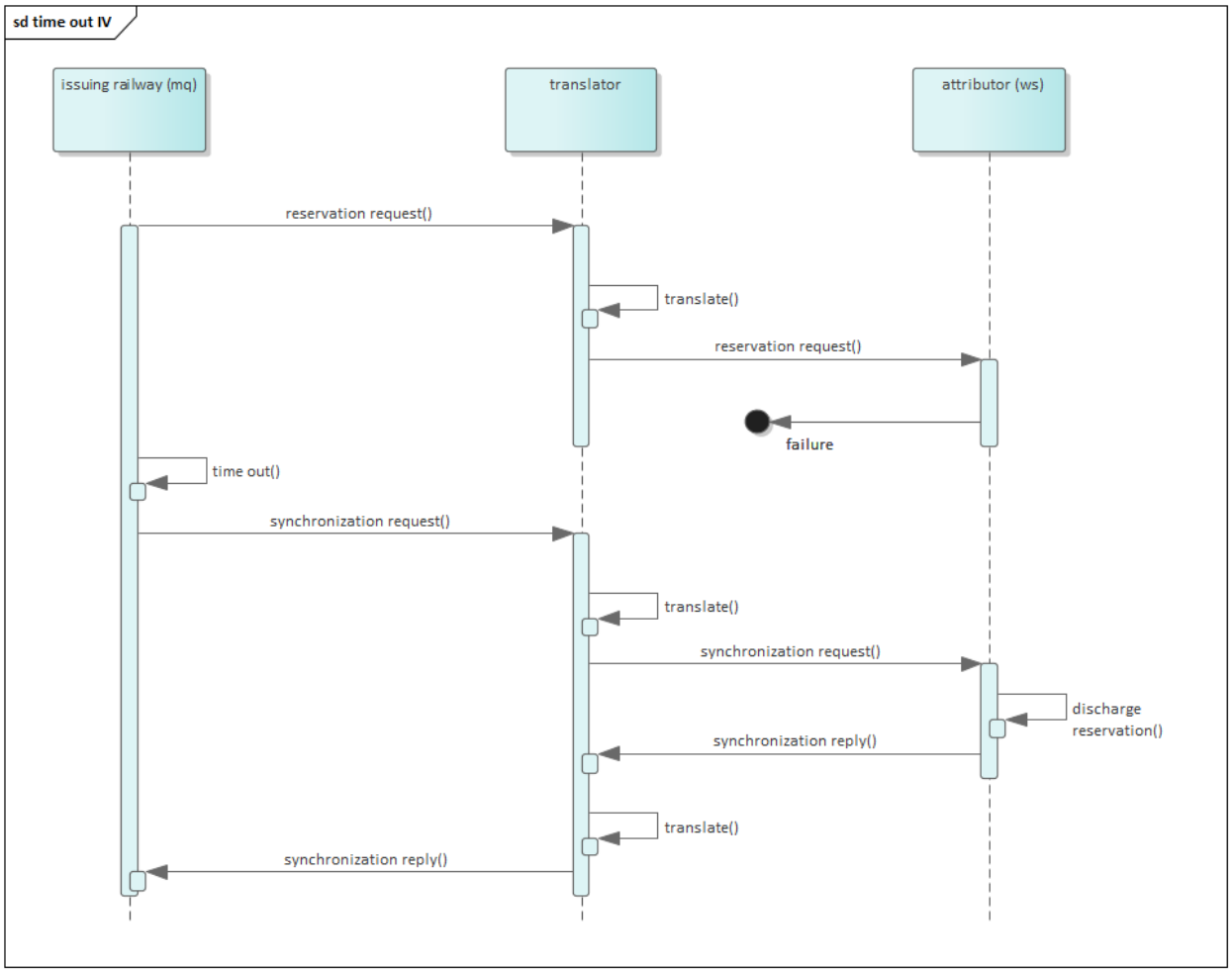
Responsibilities:

The issuing system is responsible to send the synchronization request.

The allocation system is responsible to clean up any reservation that might have been made in case the issuing system sends the appropriate synchronization request. The allocating railway must not account for this reservation.




sd time out I
issuing railway (mq)
translator
attributor (ws)
reservation request()
translation()
failure
web service unavailable or time out
time out()
synchronization request()
the same procedure applies in case that the time out error occurs between issuing railway and translator
translation()
synchronization request()
synchronization reply()
translation()
synchronization reply()


sd time out IV
issuing railway (mq)
translator
attributor (ws)
reservation request()
translate()
reservation request()
failure
time out()
synchronization request()
translate()
synchronization request()
discharge reservation()
synchronization reply()
translate()
synchronization reply()

A.4.3. Cancellation Correction or Synchronization Request Timeout

Situation:

The issuing system has sent a cancellation, synchronization or correction request and did not receive a reply in time.

Reaction:

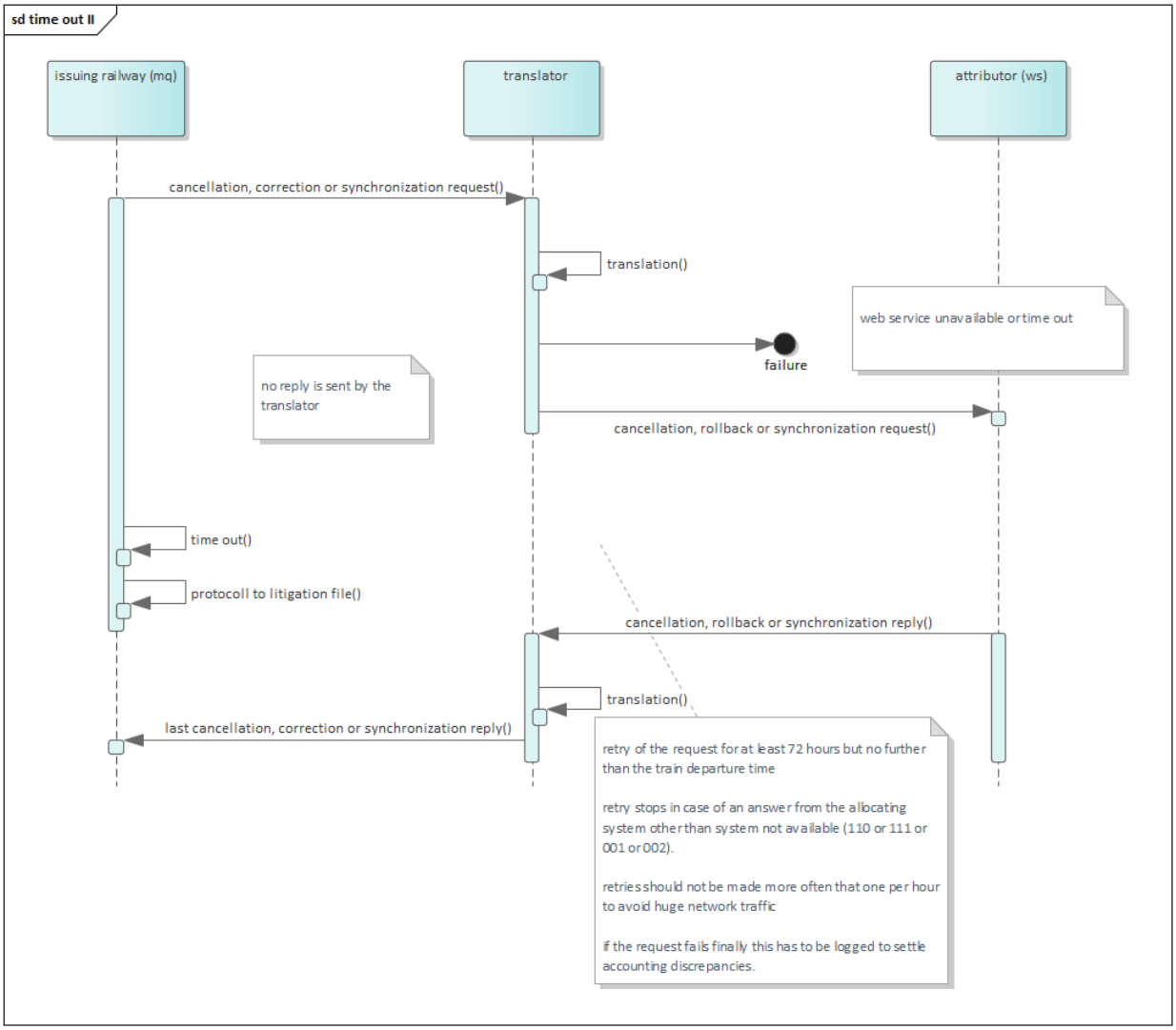
The translator does not send a reply to the issuing system immediately. The translator retires to send the request to the allocation system.

In case of a cancellation or correction request the departure date is included in the request and the translator can stop the retries after the departure date. In case of a synchronization request the retries can be stopped after 72 hours.

The issuing system does not need to process the last reply by the translator.

Responsibilities:

The translator is responsible to retry the requests to the allocating system. The allocating railway must not account for this reservation if the issuing system has sent the appropriate synchronization request.


sd time out II
issuing railway (mq)
translator
attributor (ws)
cancellation, correction or synchronization request()
translation()
web service unavailable or time out
failure
no reply is sent by the translator
cancellation, rollback or synchronization request()
time out()
protocoll to litigation file()
cancellation, rollback or synchronization reply()
translation()
last cancellation, correction or synchronization reply()
retry of the request for at least 72 hours but no further than the train departure time
retry stops in case of an answer from the allocating system other than system not available (110 or 111 or 001 or 002).
retries should not be made more often that one per hour to avoid huge network traffic
if the request fails finally this has to be logged to settle accounting discrepancies.

A.4.4. Information Request Timeout

Situation:

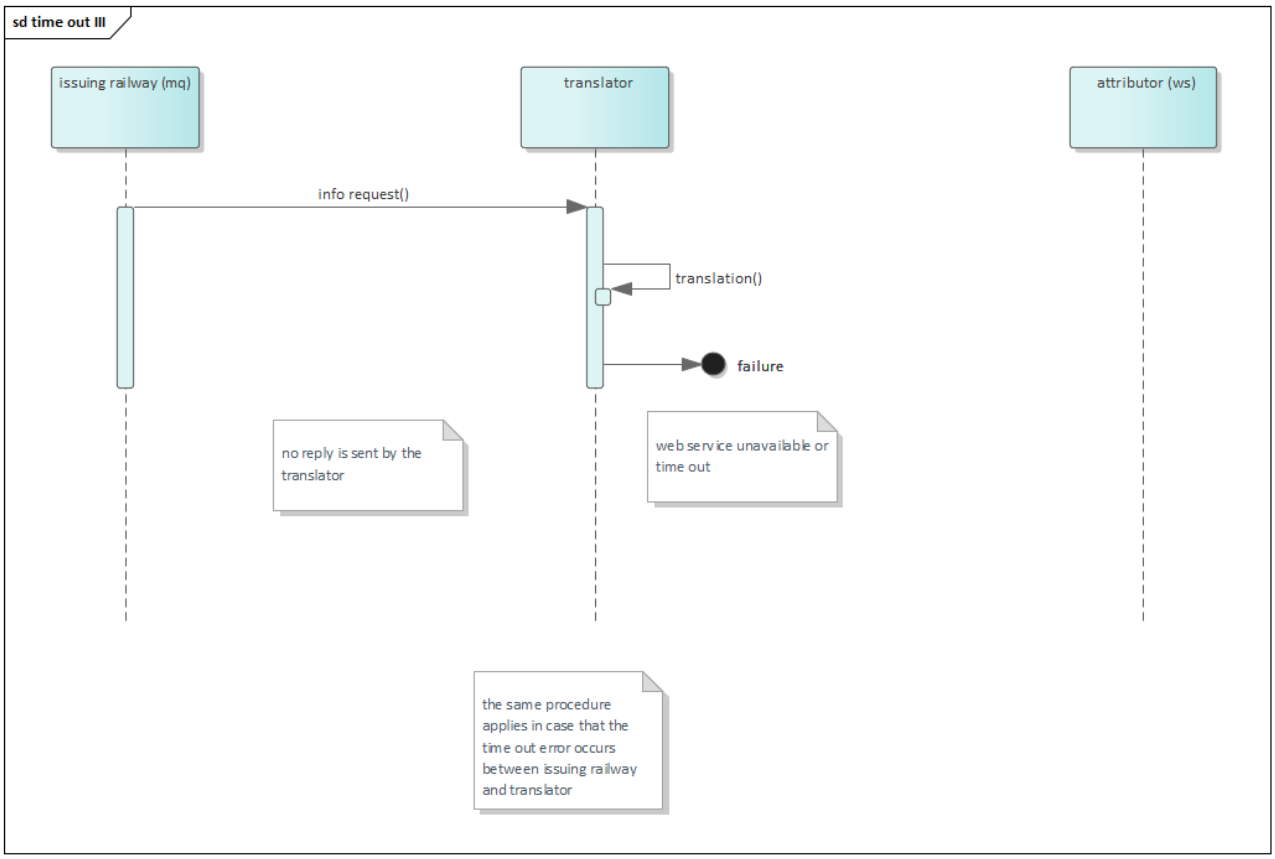
The issuing system has sent an information request (e.g. availability or reservation info request) and did not receive a reply in time.

Reaction:

None

Responsibilities:

None



A.4.5. Syntax error on a reservation request in the allocating system

Situation:

The issuing system has sent a reservation request. The request was translated and sent to the allocating system. The allocating system cannot process the request

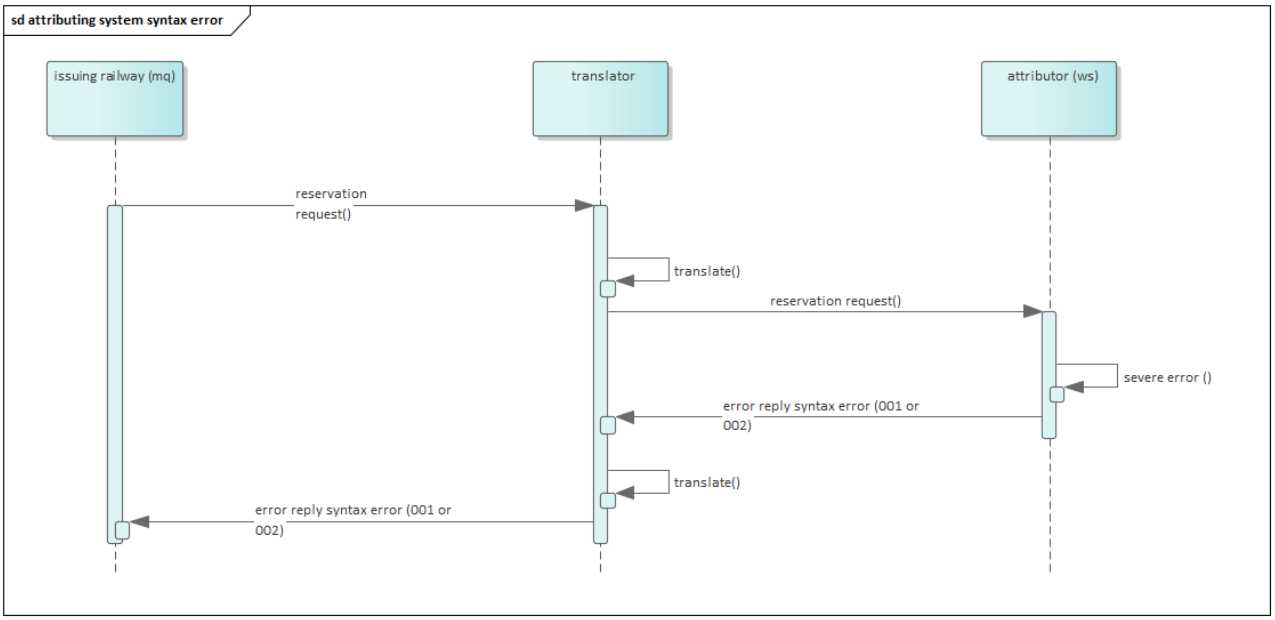
Reaction:

The translator translates the syntax error reply.

The translator has to log the transaction and investigate the situation with the allocating railway.

Responsibilities:

The allocating system is responsible to clean up any reservation made on this request.



A.4.6. Syntax error on a cancellation, synchronization or rollback request in the allocating system

Situation:

The issuing system has sent a cancellation, synchronization or correction request. The request was translated and sent to the allocating system. The allocating system cannot process the request and answers with syntax error.

Reaction:

The translator translates the syntax error reply

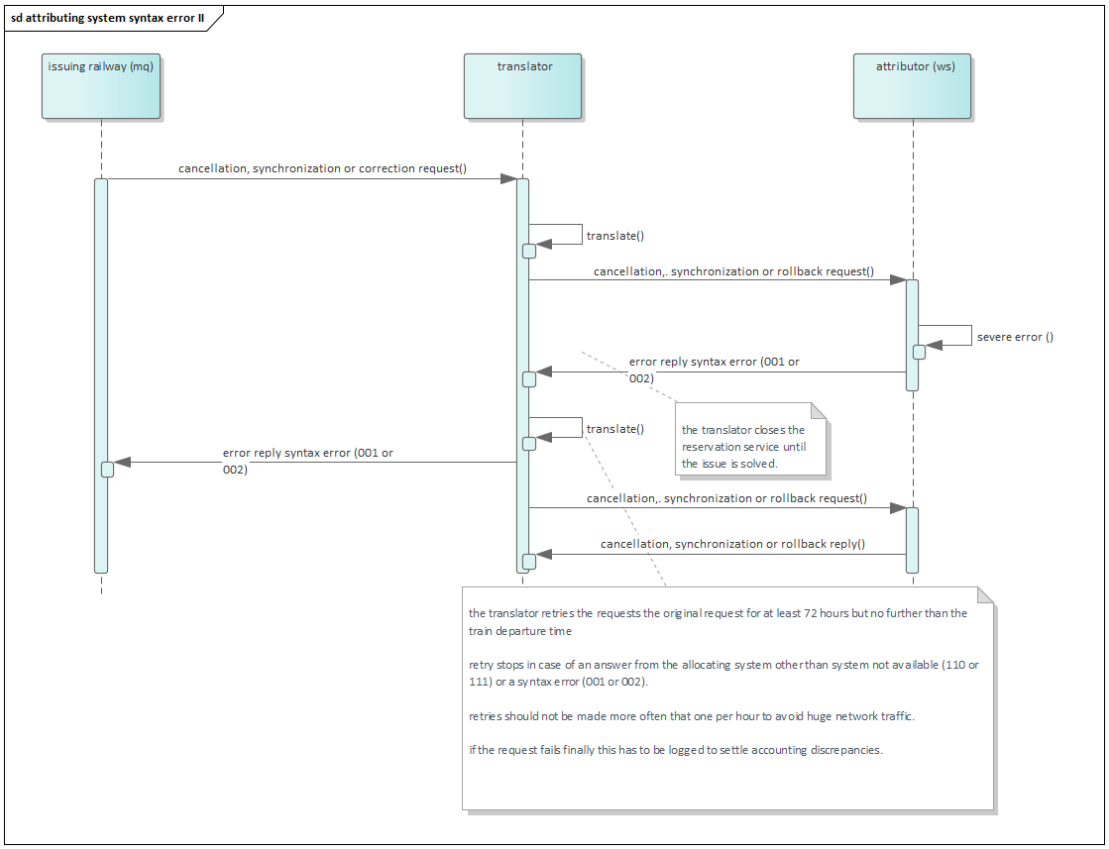
The translator closes the reservation service until the issue is resolved.

The translator retries the requests.

Responsibilities:

The translator is responsible to close the reservation service to avoid further damage.

The translator has to inform the issuer and the allocator about the transaction to remove the reservations from accounting.



A.4.7. Translator cannot translate reservation reply

Situation:

The issuing system has sent a reservation request. The request was translated and sent to the allocating system. The translator cannot translate the reservation reply of the allocating system.

Reaction:

The translator does not send a reply.

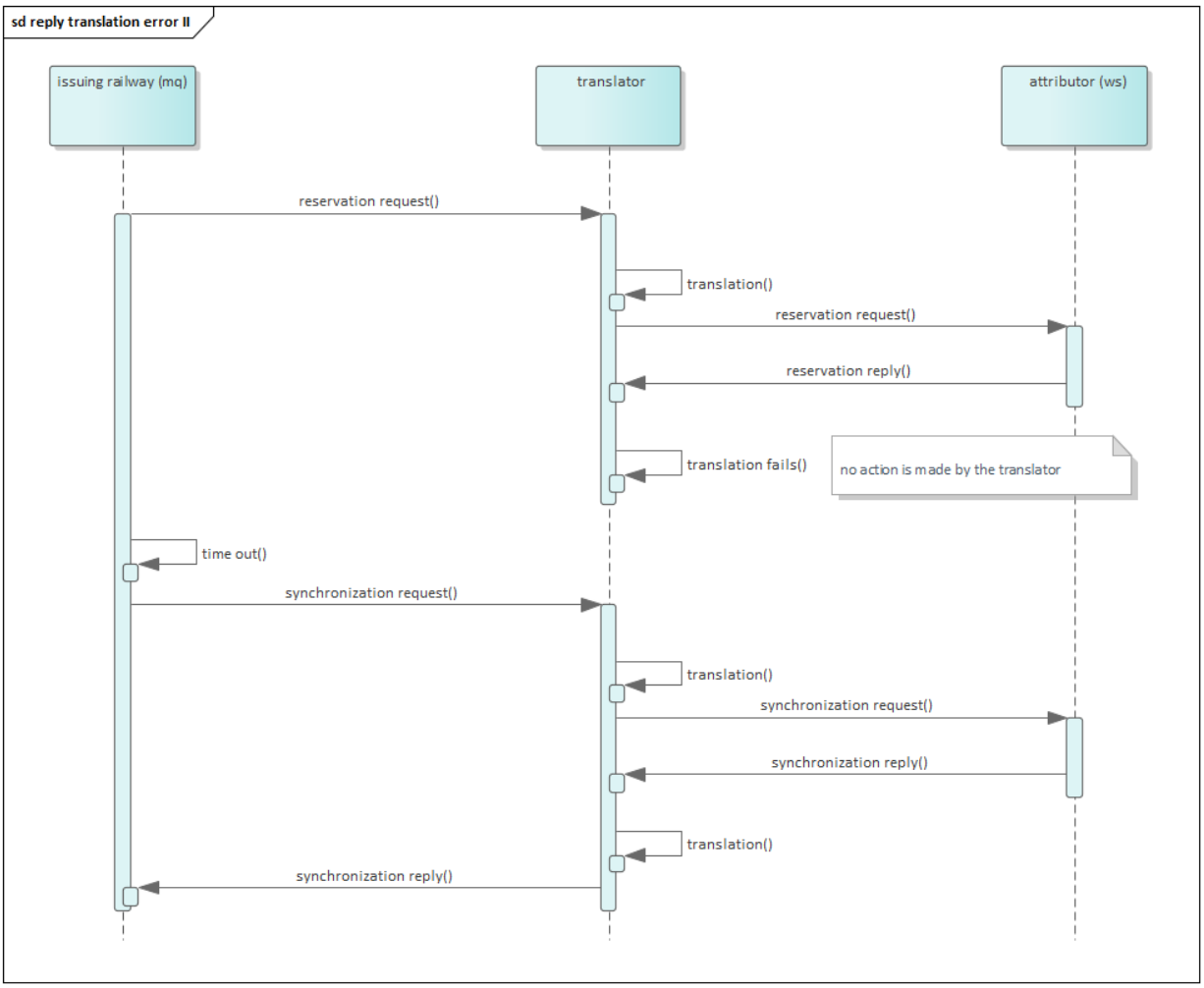
The translator logs the transaction and investigates the situation with the allocating railway.

The issuing system sends a synchronization request.

Responsibilities:

The issuing system is responsible to send the synchronization request.

The allocating system is responsible to cancel the reservation if the issuing system has properly send the synchronization request and the translator has forwarded the request to the allocating system.



A.4.8. Translator cannot translate cancellation, synchronization or rollback reply

Situation:

The issuing system has sent a cancellation, synchronization or correction request. The request was translated and sent to the allocating system. The translator cannot translate the reply of the allocating system.

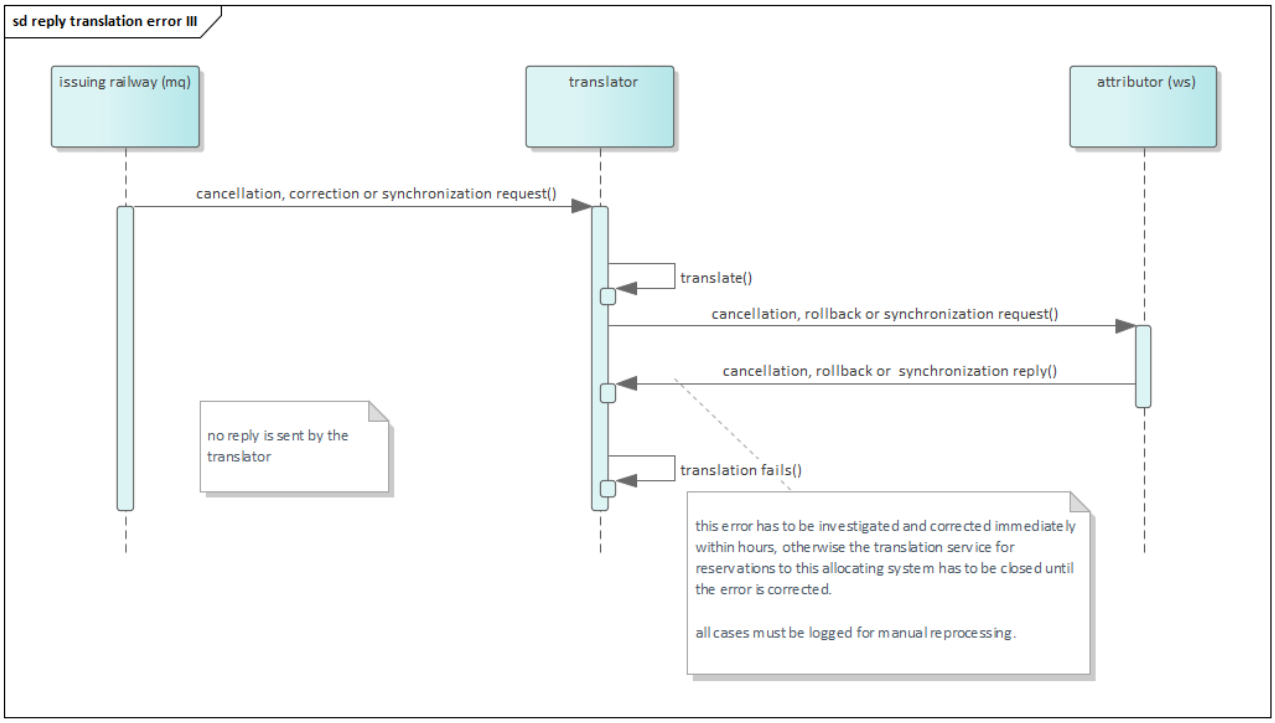
Reaction:

The translator does not send a reply.

The translator closes the reservation service to the allocating system until the error is resolved.

Responsibilities:

The translator is responsible to close the reservation service until the error is resolved.



A.4.9. Translator cannot translate information reply

Situation:

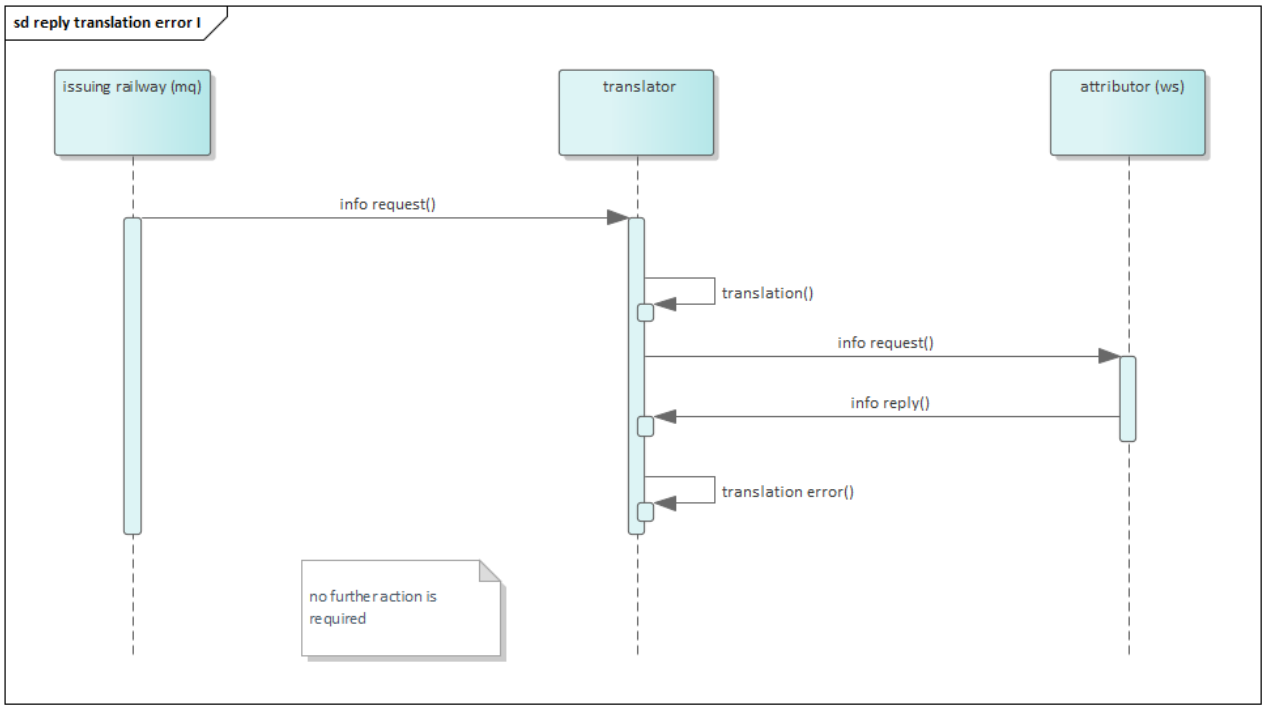
The issuing system has sent an information request (e.g. availability or reservation-info request). The request was translated and sent to the allocating system. The translator cannot translate the reply of the allocating system.

Reaction:

The translator does not send a reply.

Responsibilities:

None.



A.5. Exchange protocol using web services to mq binary translator

A.5.0. General

This transmission protocol can be used in case of communication between a web service and an mq-series system using an intermediate translator. It concerns the requesting and replying applications and the translator. It is assumed, that the xml version of the messages is used by the web service and the binary messages are used in the allocating system.

The connection between the terminals and systems to which they are connected, are the exclusive responsibility of these systems.

A.5.1. Translator cannot translate Reservation Request

Situation:

The issuing system has sent a reservation request and the Translator cannot translate the request.

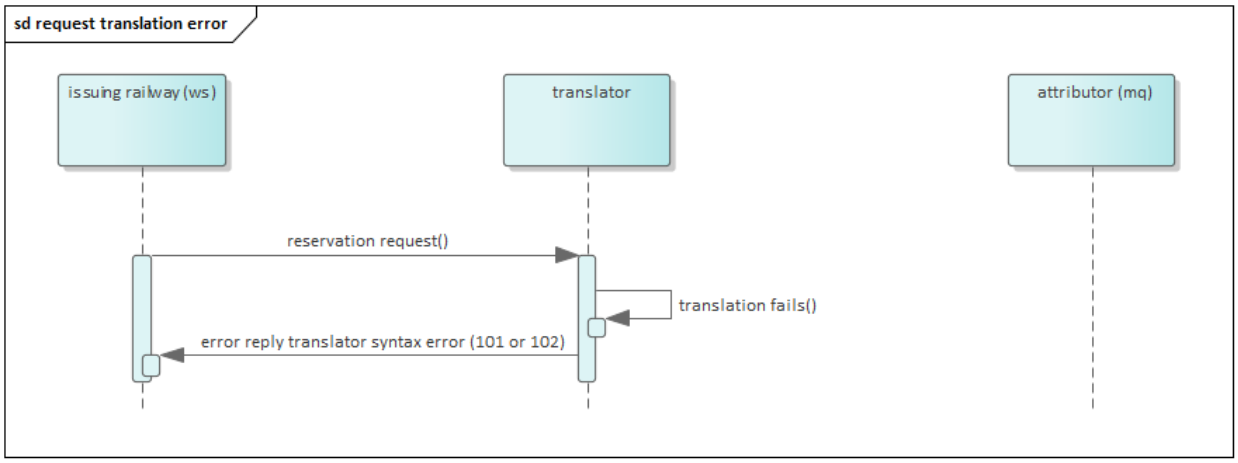
Reaction:

The translator must send syntax error reply 101 or 102 if technically possible.

The translator must investigate the situation unless he is sure that it was not a cancellation, synchronization or rollback request.

Responsibilities:

The translator must investigate the situation unless he is sure that the request was not a cancellation, synchronization or rollback request.



A.5.2. Translator cannot translate Cancellation, Synchronization or Rollback Request

Situation:

The issuing system has sent a cancellation, synchronization or rollback request and the translator cannot translate the request.

Reaction:

The translator must send syntax error reply 101 or 102.

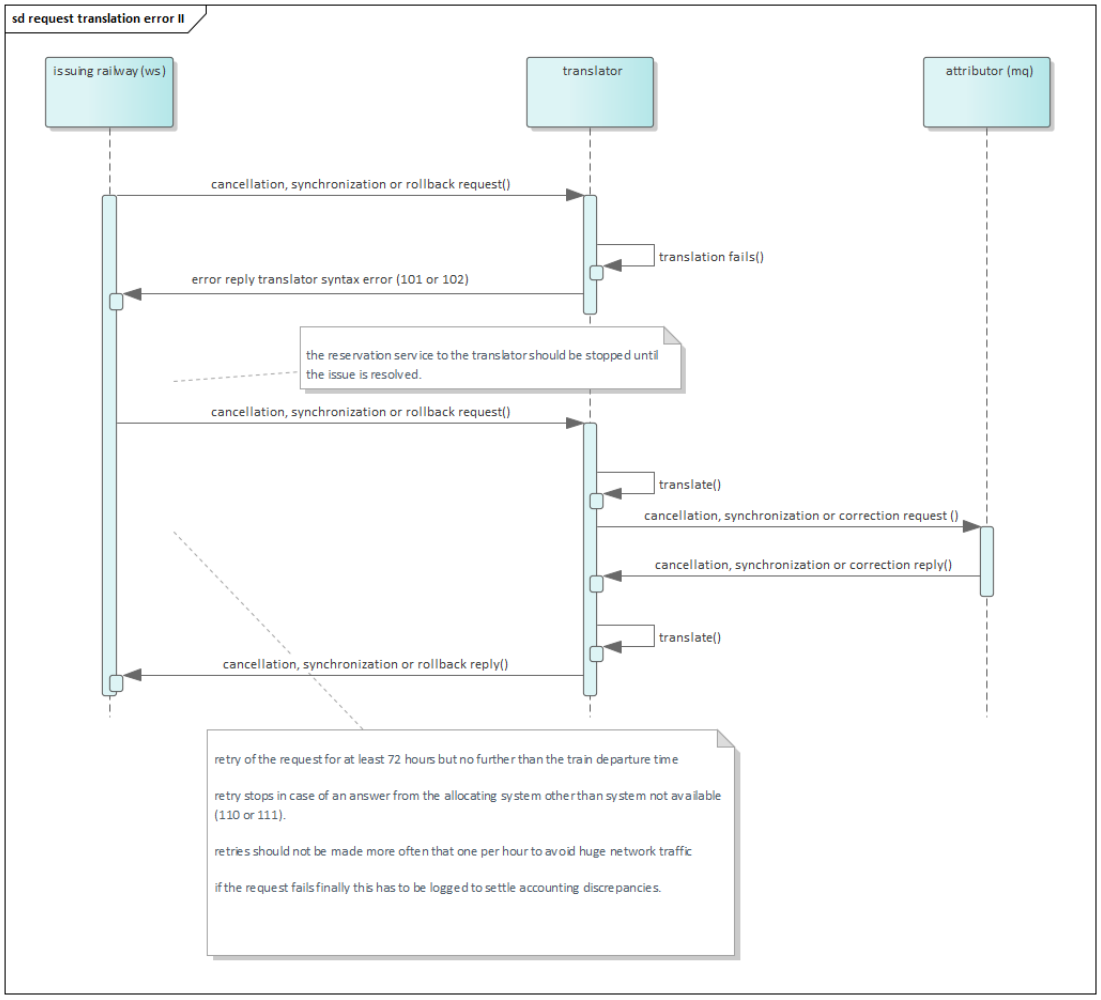
The issuing system should stop the reservation service with the translator.

The issuing system must investigate the issue.

The issuing system must repeat the requests.

Responsibilities:

The issuing system is responsible to close the connection to the translator.



A.5.3. Translator cannot translate Information Request

Situation:

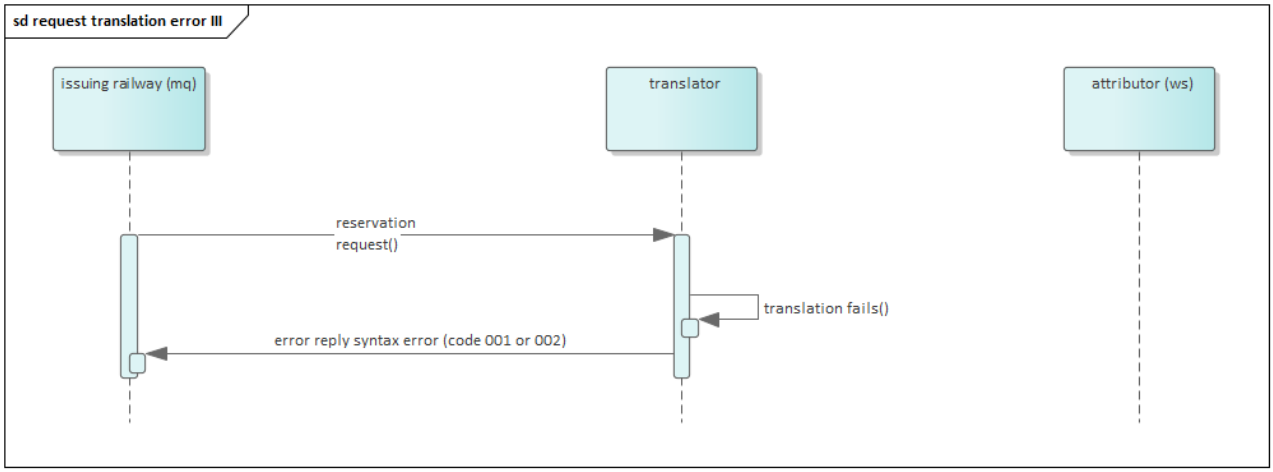
The issuing system has sent an information request (e.g. availability or reservation info request) and the Translator cannot translate the request or the request contains schema validation errors..

Reaction:

The translator must send syntax error reply 101 or 102.

Responsibilities:

None



A.5.4. Timeout on Reservation Request

Situation:

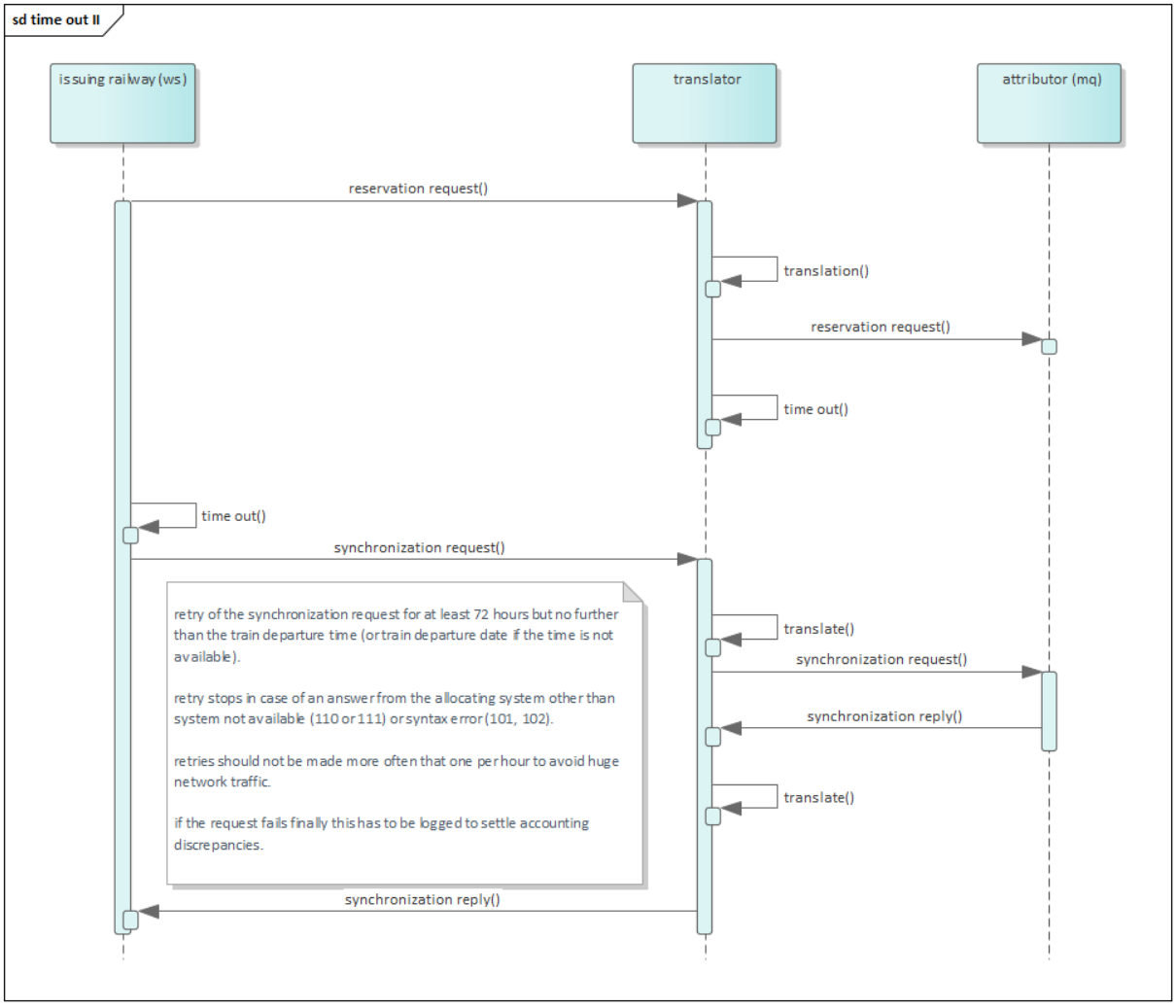
The issuing system has sent a reservation request and did not receive an answer in time.

Responsibilities:

The issuing system is responsible to send the synchronization request(s).

The issuing system is responsible to send synchronization requests that identify a reservation request uniquely by date and dialogue number. It is not allowed to reuse a dialogue number that has been used for a reservation on that date except this reservation was already cancelled.

The allocation system is responsible to clean up any reservation that might have been made in case the issuing system sends the appropriate synchronization requests and the translator forwarded them. The allocating railway must not account for this reservation if the synchronization requests were send and forwarded correctly.



A.5.5. Timeout on Cancellation, Synchronization or Rollback Request

Situation:

The issuing system has sent a cancellation. Synchronization or rollback request and did not receive an answer in time.

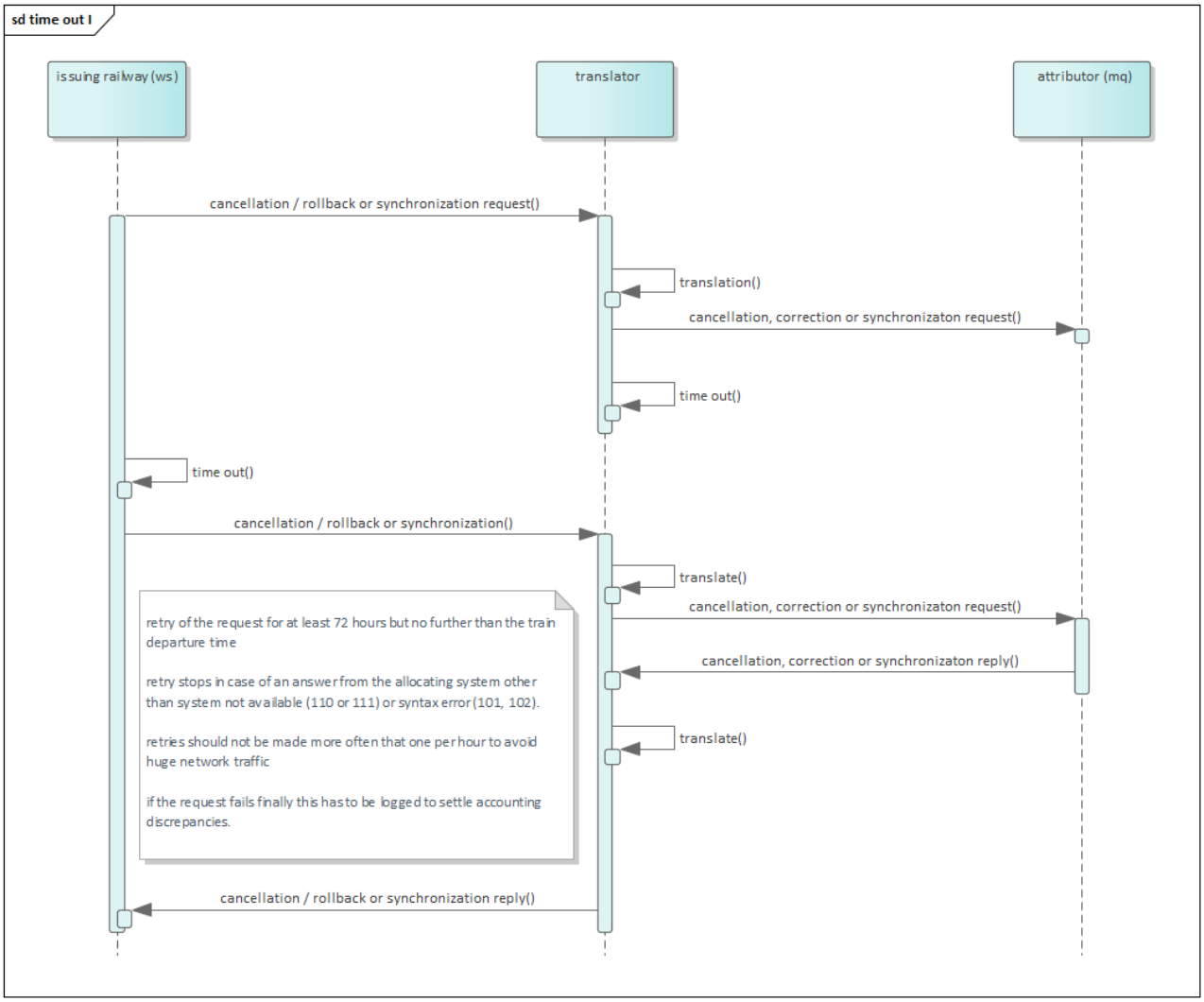
Reaction:

The translator does not send a reply.

The issuing system repeats the request until it is successful.

Responsibilities:

The issuing system is responsible to resend the request.



A.5.6. Allocating System unavailable for a reservation request

Situation:

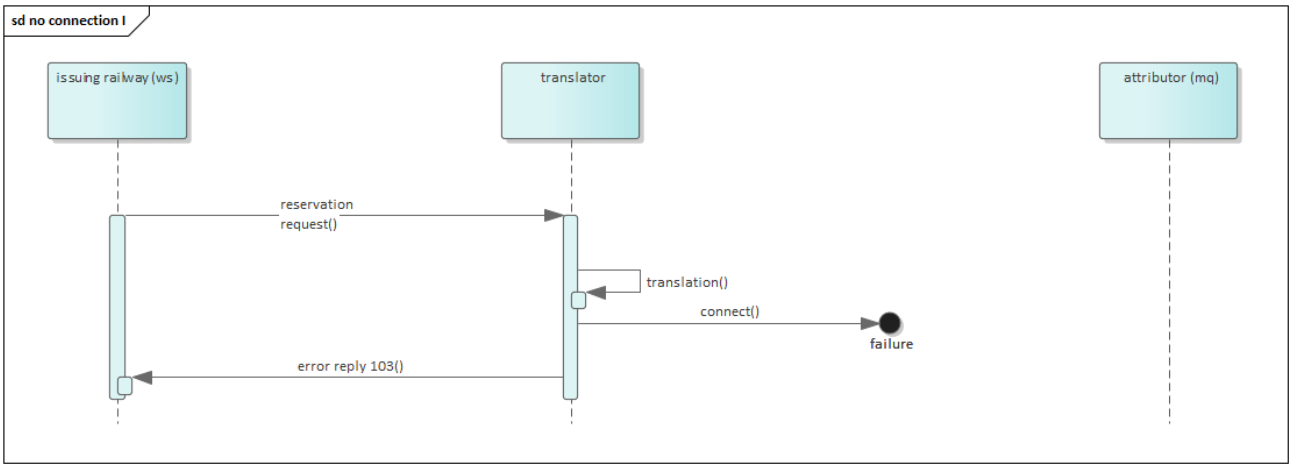
The issuing system has sends a reservation request. The translator cannot establish a connection to the allocating mq-service.

Reaction:

The translator sends error reply allocating system unavailable (code 103).

Responsibilities:

None.



A.5.7. Allocating System unavailable for a cancellation, synchronization or correction request

Situation:

The issuing system has sent a cancellation, synchronization or rollback request. The translator cannot establish a connection to the allocating mq-service.

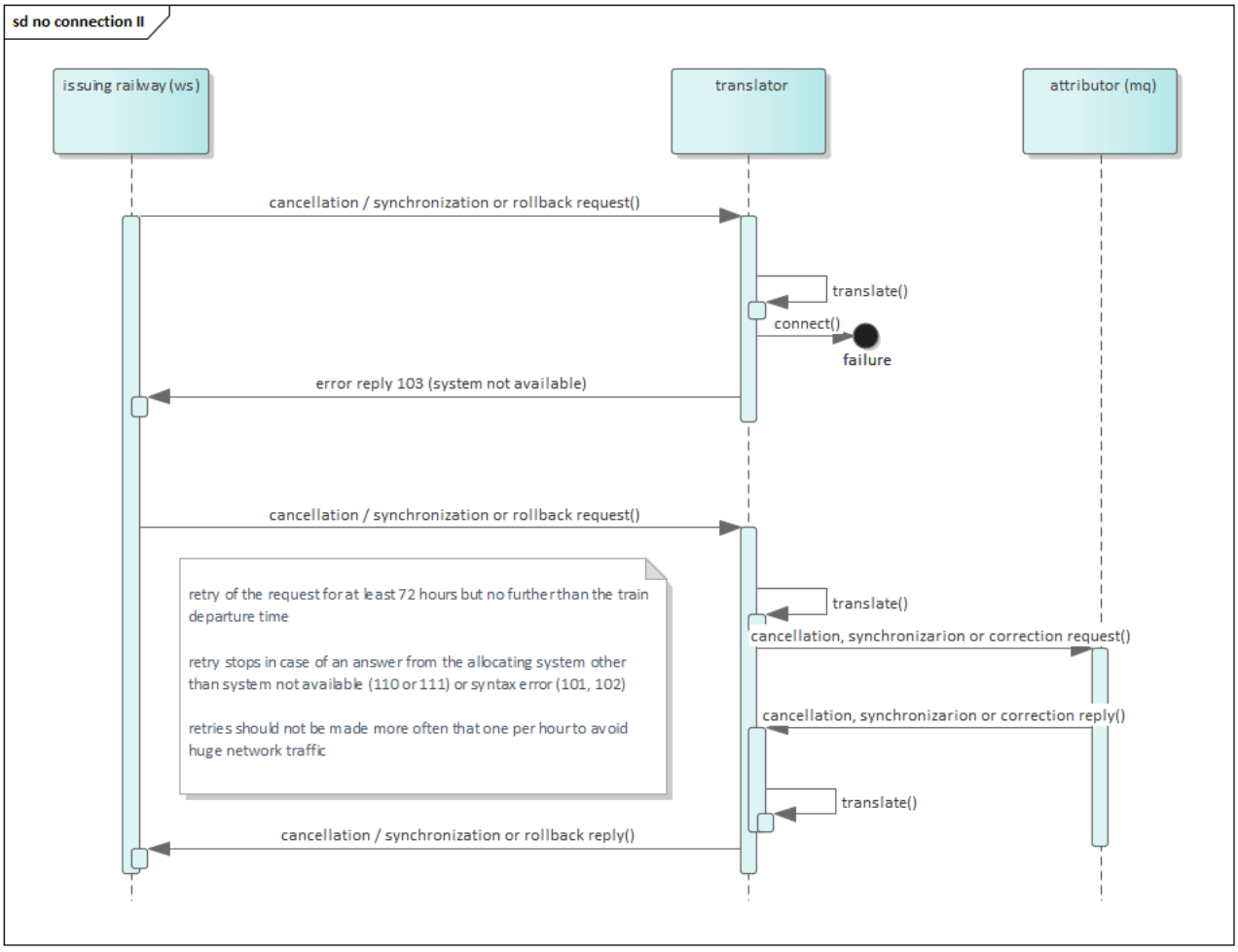
Reaction:

The translator sends error reply allocating system unavailable (code 103).

The issuing system retries the request until it is successful.

Responsibilities:

The issuing system is responsible to resent the requests.



A.5.8. Translator cannot translate reservation reply

Situation:

The issuing system has sent a reservation request. The translator cannot translate the reply sent by the allocating system.

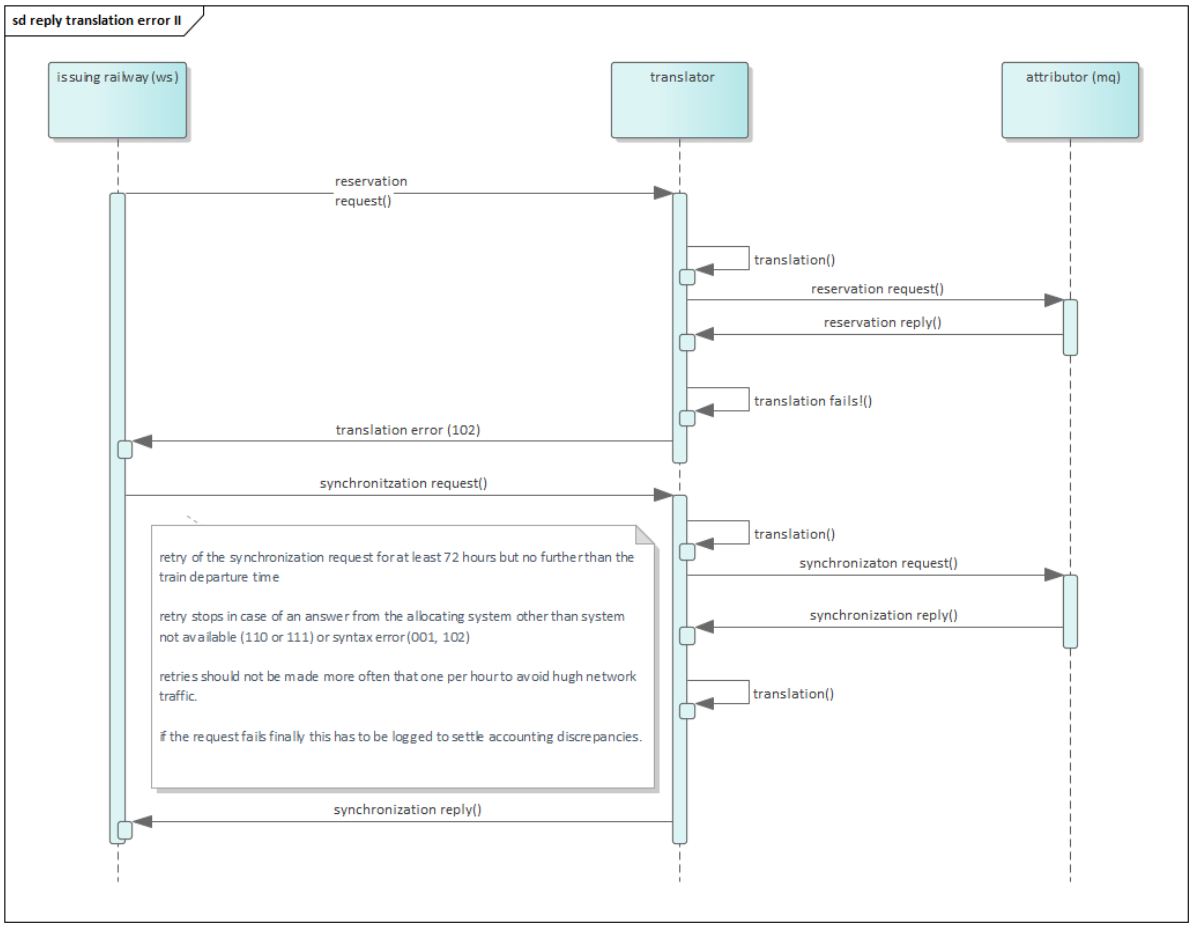
Reaction:

The translator sends an error reply to the issuing system (code 104 or 105).The issuing system sends a synchronization request. The issuing system must retry the synchronization request until it is successful.

The issuing system is responsible to send synchronization requests that identify a reservation request uniquely by date and dialogue number. It is not allowed to reuse a dialogue number that has been used for a reservation on that date except this reservation was already cancelled.

Responsibilities:

The issuing system is responsible to send a synchronization request. The allocating system must remove the reservation from the accounting in case that the issuing system has sent the synchronization requests and the translator has forwarded them correctly. The translator is responsible to investigate the situation with the allocating railway.



A.5.9. Translator cannot translate cancellation, rollback and synchronization reply

Situation:

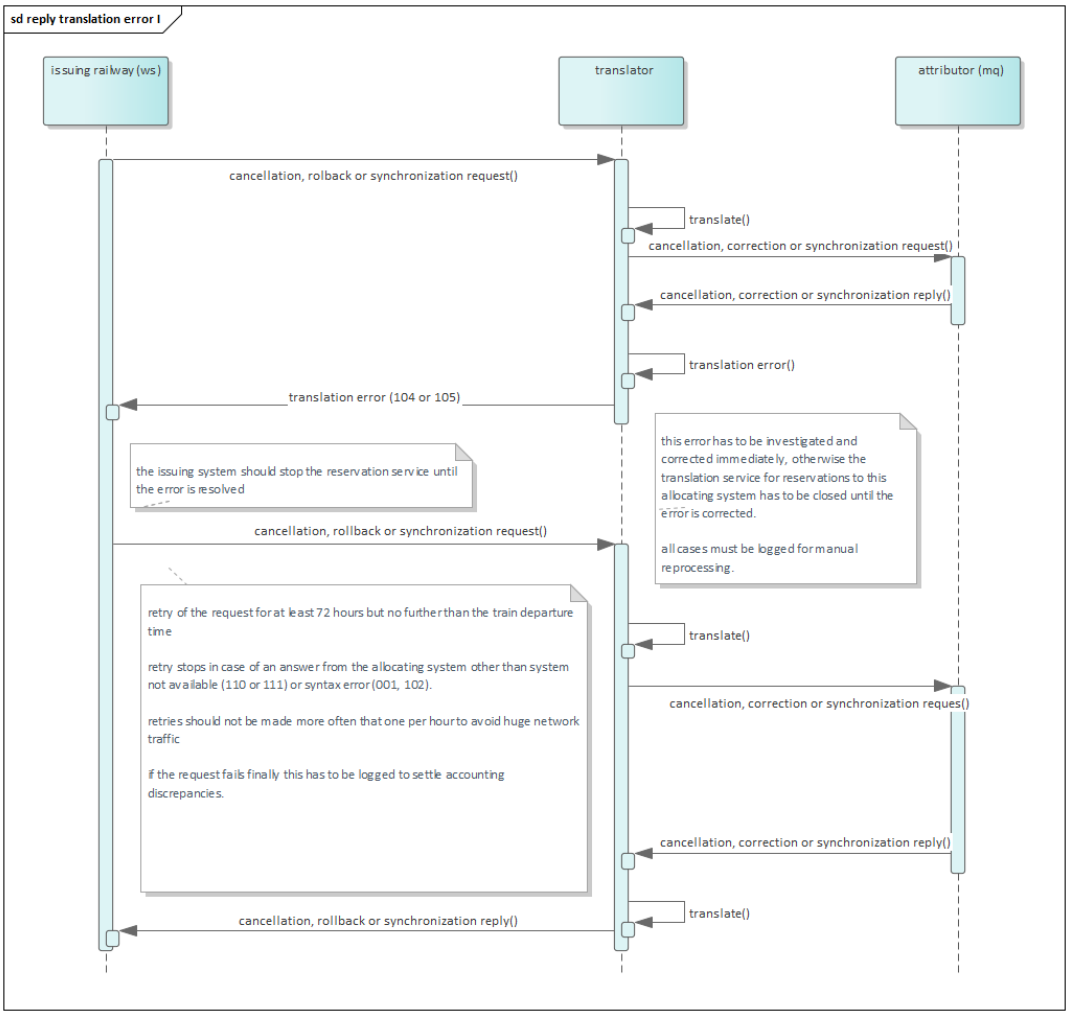
The issuing system has sent a cancellation, synchronization or rollback request. The translator cannot translate the reply.

Reaction:

The translator sends error reply translator syntax error (code 104 or 105) providing the possibility to the issuing system to close the reservation service to the allocating railway. The issuing system should stop the reservation service to the translator for this allocating system to avoid further damage. The issuing system must retry the request as it is not clear whether the cancellation, correction or synchronization has been processed successfully.

Responsibilities:

The issuing system is responsible to retry the requests. The allocating system must cancel the reservation if the issuing system has send the request and the translator has forwarded the request correctly.



A.5.10. Translator cannot translate information reply

Situation:

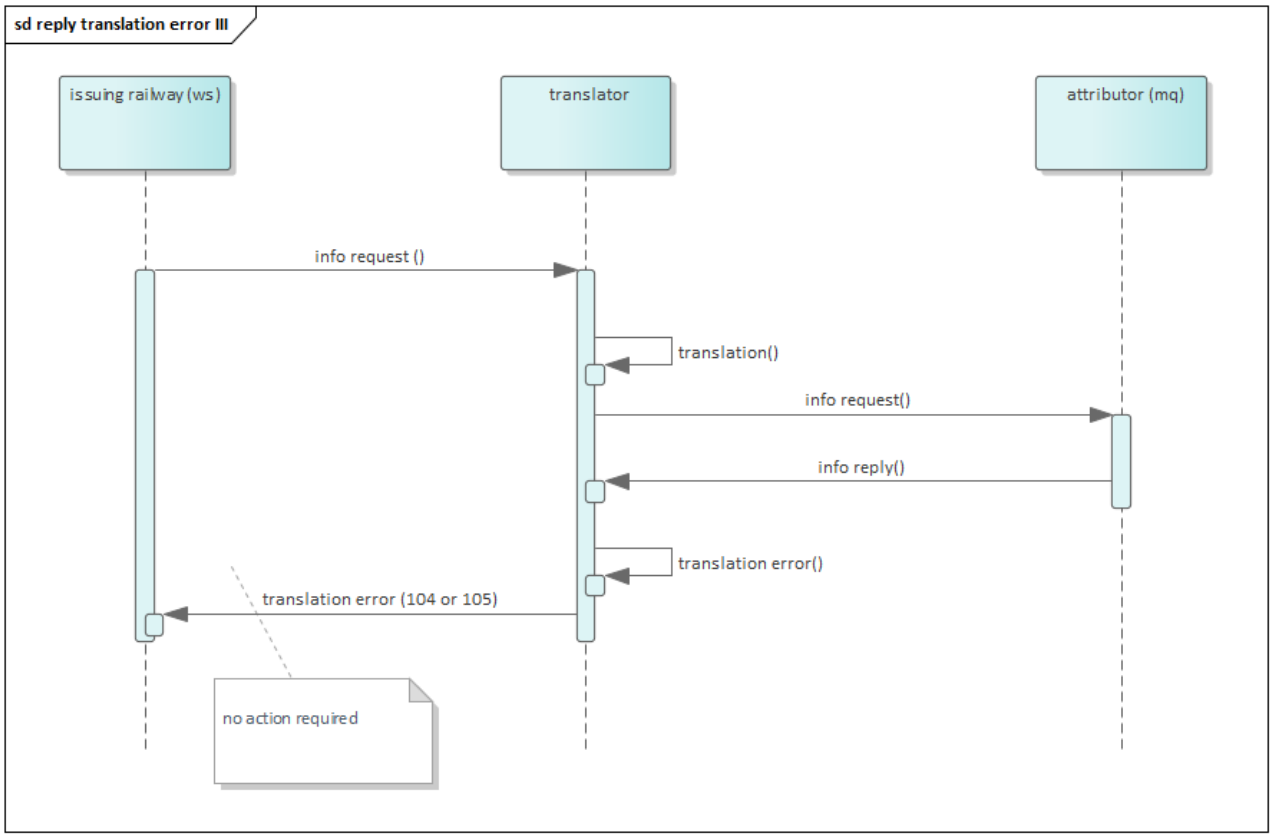
The issuing system has sends an information request (e.g. availability and reservation-info request). The translator cannot translate the reply.

Reaction:

The translator sends error reply translator syntax error (code 104 or 105).

Responsibilities:

None.



A.5.11. Reservation Reply cannot be processed by issuing system

Situation:

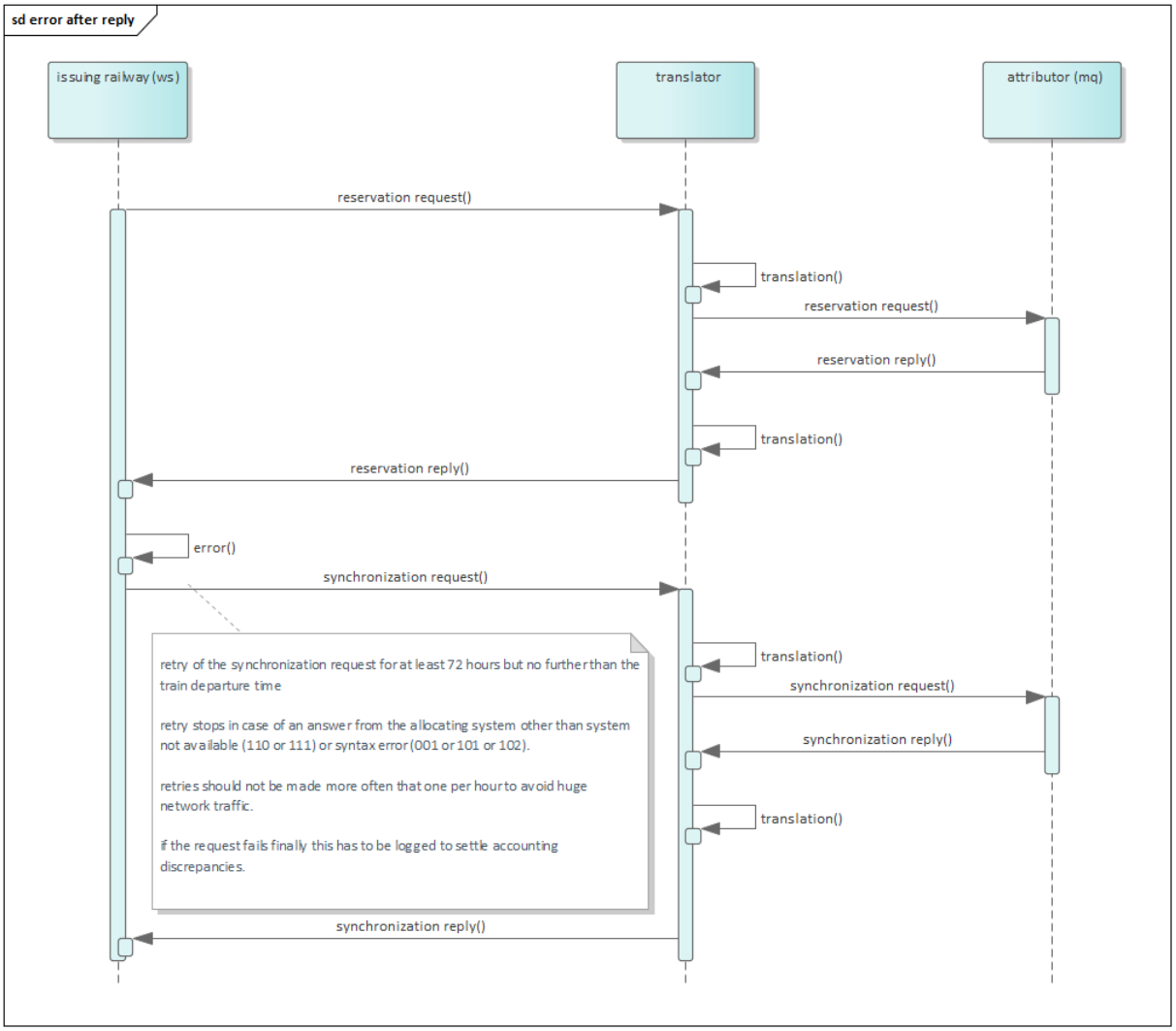
The issuing system has sent a reservation request and did receive a reply. An error occurred during the processing of the reply. **The reservation reference number could not be retrieved from the reply.**

Reaction:

The issuing system sends a synchronization request. The synchronization request has to be repeated if it is not successful.

Responsibilities:

The issuing system is responsible to send the synchronization request. The allocating system has to remove the reservation from the accounting in case that the issuing system sends the synchronization requests and the translator forwards them correctly.



A.5.12. Reservation Reply cannot be processed by issuing system

Situation:

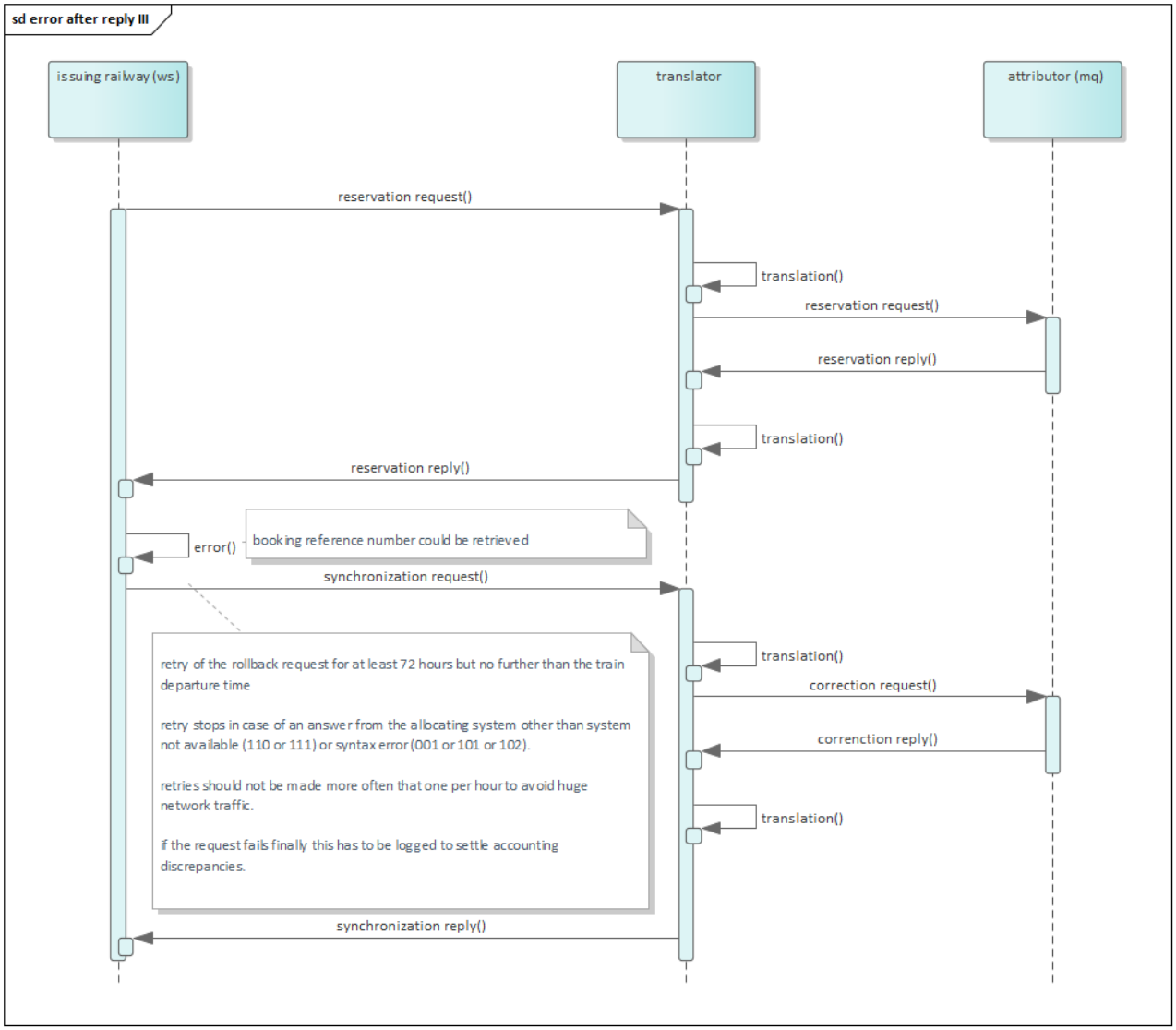
The issuing system has sent a reservation request and did receive a reply. An error occurred during the processing of the reply. **The reservation reference number could be retrieved from the reply.**

Reaction:

The issuing system sends a rollback request. The rollback request has to be repeated if it is not successful.

Responsibilities:

The issuing system is responsible to send the rollback request. The allocating system has to remove the reservation from the accounting in case that the issuing system sends the rollback requests and the translator forwards them correctly.



A.5.13. Cancellation, rollback or synchronization reply cannot be processed by issuing system

Situation:

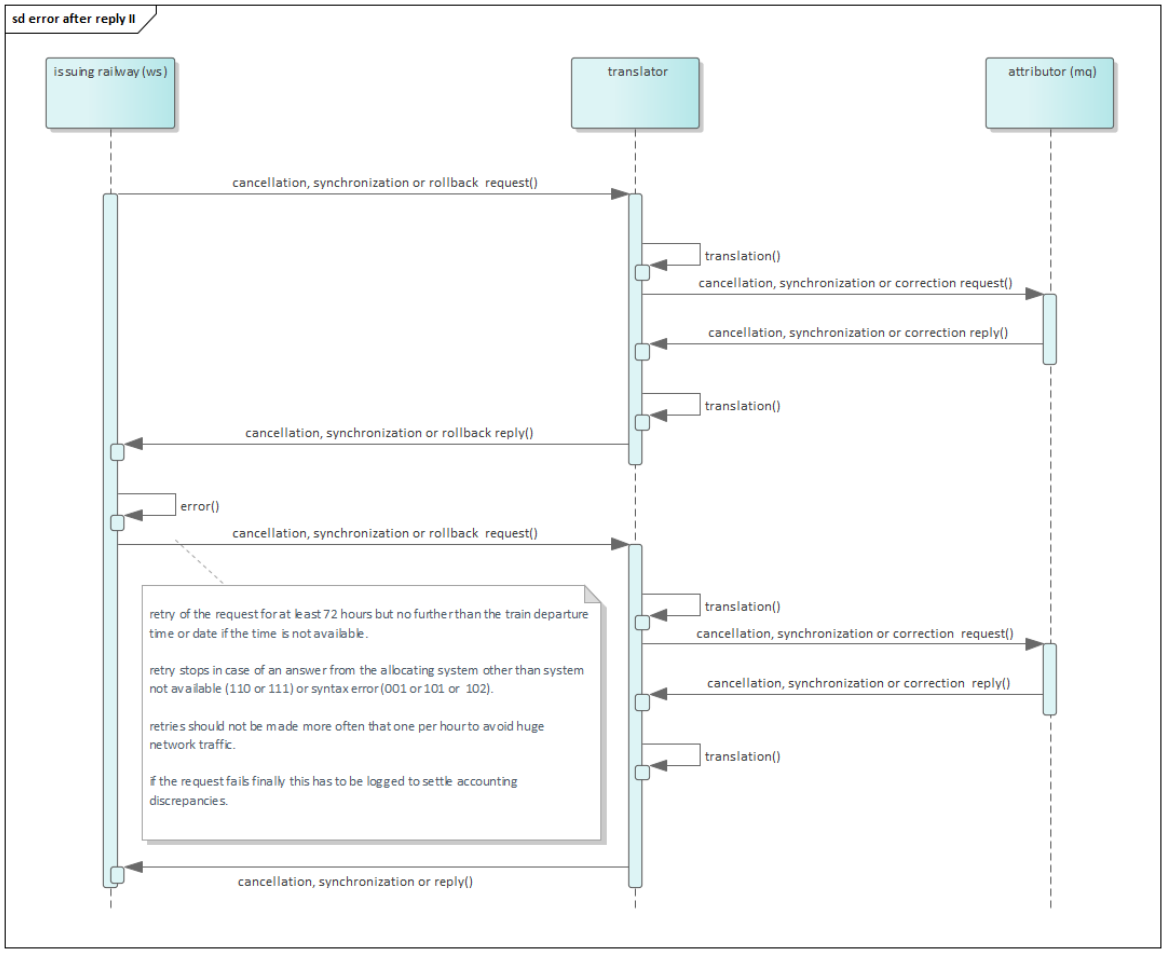
The issuing system has sent a cancellation, rollback or synchronization request and did receive a reply. An error occurred during the processing of the reply.

Note: This scenario does not apply in case of negative replies that do not indicate a technical error (e.g. negative reply “booking already cancelled”).

Reaction:

The issuing system retries to send the request.

The issuing system must investigate the situation.

Responsibilities:

The issuing system is responsible to resend the cancellation, rollback or synchronization request. The allocating system has to remove the reservation from the accounting in case that the issuing system sends the cancellation, rollback or synchronization requests and the translator forwards them correctly.