

TAP TSI

Telematics Applications for Passenger Services
Technical Specifications for Interoperability



Project co-funded by the
European Commission

TIMETABLES IMPLEMENTATION GUIDE

Project: TAP Phase One

Release: 1.0 – To DG MOVE, ERA, TAP Steering Committee

Date: 13 May 2012

Author: Ugo Dell’Arciprete (Work Stream Leader)

Owner: TAP Phase One Project Team

Client: DG MOVE, ERA

Document Ref: Timetables Implementation Guide

Version No: 1.0 (internal version number 5.1)

1 Progress History

1.1 Document Location

This document will be uploaded to the “TAP TSI/TAP Retail activities/Schedules _ Timetables (EG S)/ Working documents/User Guides” folder of the project extranet (members’ area).

1.2 Revision History

Date of delivery: 13 May 2012

Revision date	Previous revision date	Summary of Changes	Changes marked
		First issue	None
2012-02-19	2012-01-07	Chapters 4,6	
2012-02-27	2012-02-19		
2012-03-13	2012-02-27		
2012-03-23	2012-03-13		
2012-03-31	2012-03-23	Changes in ch. 6,7,9,Appendices A,D	
2012-04-16	2012-03-31	Chapter 7	
2012-05-01	2012-04-16	Ch. 6, 6.3.2.5, 6.4.1, 6.5.2.6, 6.5.2.7, 8, 9.2.5, 10, App. A, D	
2012-05-09	2012-05-01	Glossary completed, text revised	
2012-05-13	2012-05-09	Final editing	

1.3 Approvals

This document requires the following approvals.

Name/ Entity	Title/ Remark	Approval	Date of Issue	Version
Project Team	Project Manager, Work Stream Leaders, Project Assistant	Done	11 May 2012	1.0
TAP SteCo	Chairs, members and alternates		15 May 2012	1.0

1.4 Distribution

This document is distributed to:

Name/ Entity	Title/ Remark	Date of Issue	Version
DG MOVE, ERA	Official recipients of the TAP Phase One	13 May 2012	1.0

	deliverables		
TAP Steering Committee	Chairs, members and alternates	13 May 2012	1.0
Project Team; UIC and Ticket Vendor project coordinators	All members of the Project Team and the coordinators involved in the Grant Agreement between DG MOVE and UIC	13 May 2012	1.0
Interested public	On http://tap-tsi.uic.org following TAP Steering Committee approval	tbd	

1.5 Document maintenance

This document is maintained by the Governance Entity.

Any stakeholder detecting errors or needing clarifications can contact the Governance Entity (e-mail address to be defined).

Until the Governance Entity is operational, stakeholders are invited to contact the following e-mail address: tap-tsi@uic.org.

Proposals for additions or updates can be sent to the same mail addresses, and will undergo the Change Control Management process described in the TAP Implementation Guides Overview.

2 Table of Contents

1	Progress History	2
1.1	Document Location.....	2
1.2	Revision History.....	2
1.3	Approvals.....	2
1.4	Distribution.....	2
1.5	Document maintenance.....	3
2	Table of Contents	4
3	Purpose	6
4	Background documents	7
5	Rights & obligations, actors	8
5.1	Rights and obligations	8
5.2	Actors	9
6	Content of data	10
6.1	Specification of SKDUPD and TSDUPD	10
6.2	General introduction to EDIFACT data deliveries.....	10
6.3	Usage of SKDUPD	12
6.4	SKDUPD full example	25
6.5	Locations data	34
7	Process	42
7.1	How to make data available	42
7.2	How to integrate data from multiple RUs.....	44
8	Current situation	45
9	Data quality	46
9.1	Security rules.....	46
9.2	Quality checks	46
10	Governance aspects	48
10.1	Organisational steps for RUs to get started.....	48
10.2	Organisational steps for Third Parties to get started	48
	Appendix A - Glossary	50
	Appendix B) - Example of conditions for data provision	53
	Appendix C) - XML messages	55
C.1	Sample from “Company.xml”	55

C.2	Sample from “country.xml”	55
C.3	Sample from “primaryLocation.xml”	56
C.4	Sample from “subsidiaryCodes.xml”	56
C.5	Sample from “subsidiaryLocation.xml”	56
D)	Data quality checks	58
D.1	Blocking errors.....	58
D.2	Potential errors	58
D.3	Remarks:	58
D.4	Suggested actions for the data users	59

3 Purpose

Regulation 454/2011 requires at the end of Phase One the issuing of deliverables on three areas:

- detailed IT specifications
- governance
- master plan

In particular “The detailed IT specifications shall describe the system and shall indicate in a clear and unambiguous manner how the system fulfils the requirements of the TAP TSI. The development of such specifications requires a systematic analysis of the relevant technical, operational, economic and institutional issues that underpin the process of implementing the TAP TSI. Therefore, deliverables shall include, but shall not be limited to, the following:

1. Functional, technical and performance specifications, the associated data, the interface requirements, the security and the quality requirements.
2. The outline of the global architecture of the system. It shall describe how the requisite components interact and fit together. This shall be based on the analysis of the system configurations capable of integrating the legacy IT facilities, while delivering the required functionality and performance.”

The purpose of this document is to provide specifications, in addition to what is already stated in the TAP itself and its accompanying Technical Documents (TDs), in order to facilitate all stakeholders involved in the TAP process, and in particular in the timetable data exchange, to correctly fulfil their obligations or assert their rights.

Since the TAP Basic Parameters and Technical Documents have been established largely on the basis of the current way of operation of the incumbent European RUs, the specifications of this document are intended mainly for the use of the RUs entering the market (“newcomers”) and of the small RUs and RUs that are not members of rail sector representative bodies.

Nevertheless part of the specifications will benefit all RUs, including the incumbent ones, in fulfilling the new requirements introduced from scratch by the TAP TSI.

At the same time, this document intends to give detailed specifications on how third parties identified by the TAP as legitimate users of the data can access them, from a technical and organisational point of view. The TAP TSI provides the framework for future enhancements of data exchange between RUs and/or Third Parties.

Chapter 8 “Current situation” provides an overview, for information purpose only, on how the subject is currently managed by the main European RUs, in case a new or smaller RU would like to adopt the same solution. Of course the only legal obligation remains the compliance with TAP TSI.

4 Background documents

The documents one has to know to implement the obligation to make available timetable data according to TAP are:

- Commission Regulation (EU) No 454/2011 of 5 May 2011 on the technical specification for interoperability relating to the subsystem 'telematics applications for passenger services' of the trans-European rail system - Basic parameter 4.2.1
- TAP TSI: ANNEX B.4 - Implementation Guide for EDIFACT Messages Covering Timetable Data Exchange; Reference ERA/TD/2009-07/INT, Version 1.1.1 of 8.3.2012
- Directory of Passenger Code Lists for the ERA Technical Documents used in TAP TSI - Reference ERA/TD/2009-14/INT, Version 1.1.1 of 8.3.2012
- TAP Implementation Guides Overview Version 1.0
- TAP Retail Architecture Description Version 1.0

The above documents can be downloaded from the website of the European Rail Agency at <https://www.era.europa.eu/Document-Register/Pages/TAP-TSI.aspx>.

An additional public document having relevance for the exchange of timetable data according to B.4 is the "United Nations Rules for Electronic Data Interchange For Administration, Trade and Transport" - Specification document for EDIFACT syntax, that can be downloaded from <http://www.unece.org/trade/untdid/welcome.htm>.

5 Rights & obligations, actors

5.1 Rights and obligations

The TAP sets an obligation for each RU to make available all timetable data of the passenger services operated by it.

Who?

The obligation is on the European licensed RUs.

For trains operated by a single RU (sole carrier in TAP glossary) the obligation is on that RU.

For trains operated by a chain of successive RUs (joint carriers in TAP glossary) the obligation is by default on each RU for the part of journey operated by that RU, unless they commonly agree that only one of the RUs will make available the timetable of the whole train (that RU will be called information provider for the train)

For trains operated by a Business Unit, i.e. a grouping of RUs which makes a joint service offer under a single brand (e.g. Thalys, Elipsos) but which is not legally an RU, the timetable data must be made available as in the previous case (each RU by default, or only one information provider)

To whom?

The timetable data are made available in non discriminatory way to all railway undertakings, third parties and public bodies. All actors (e.g. TVs, non UIC railways) must have access to the same content with the same timeliness and accuracy. The RU has the right to know who is the receiver of its own timetable data and which is the intended use of the data. The RU as the owner of the timetable data is allowed to require a contract with the receiver of the data (third party). The RU is allowed to invoice a reasonable financial compensation for the effort to establish a data provision with all its needed tasks. The data must be released under the same conditions for all actors in a fair and transparent manner. The conditions can include rules like the ones shown as example in Appendix B.

Which services?

Only those available for purchase by the public. Therefore there is no obligation to make available data concerning charter trains, pilgrim trains, special trains for journeys of authorities, trains for movement of troops, etc.

When?

The TAP makes reference to the “annual timetable”. The yearly frequency of timetable production is stated by Commission Decision (2002/844/EC) of 23 October 2002, which sets the change of working timetable at midnight on the second Saturday in December.

The annual timetable must be made available at least two months before that deadline, but only for those services over which the RU has sole control, i.e. full legal and

commercial freedom to decide them. If the services are subject e.g. to the approval of a Public Transport Authority, making them available can be delayed as long as the approval is pending.

The “annual timetable” should be read as “a 12 months’ timetable must be made available”. However if the RUs have intermediate timetable changes, they can update the timetable data according to the TAP TSI requirements, at least 7 days before those timetable changes take effect.

It is also to be noted that the TAP requires that timetable data must be kept available at least for 12 months after such data have expired.

What?

Though the title of TAP Basic Parameter 4.2.1 is “Exchange of timetable data”, not only timetable data *stricto sensu* must be made available in form of SKDUPD files, but also data concerning all stations mentioned in the timetable data as departure, stop or destination of a train must be made available in form of TSDUPD files.

5.2 Actors

The actors in the domain of timetables are mainly the RUs, in the many different roles they can play.

As carrier, an RU can be (see definitions in the glossary):

- Joint carrier
- Sole carrier

As company subject to TAP, an RU can be:

- Information provider
- Reservation provider

On the other side the RUs, as well as third party Ticket Vendors or Public Transport Authorities, can benefit of the timetable exchange system as;

- Data user

6 Content of data

Chapter 6 of this Implementation Guide explains the standards used in B.4 and gives some guidelines on how to use these standards.

NB: the Basic Parameter 4.2.22 of TAP suggests also standards for the exchange of timetable data with other modes of transport, in particular the European Norms “Transmodel”, “IFOPT” and “SIRI”.

Since these standards are still partly under development, and the TAP only gives a suggestion (the term “should” is used instead of “shall”) it is premature to write detailed technical specification for the use of these standard in the present Implementation Guide.

EDIFACT messages

EDIFACT is a worldwide standard for data exchange. Technical Document B.4 uses the UN/EDIFACT standard which is described in the website whose address is referenced in above chapter 4.

EDIFACT is a message oriented data format: the different data is organised in messages which are named in a unique way.

B.4 uses two different messages:

- SKDUPD for the transfer of “schedule data” which (in general) is train data.
- TSDUPD for the transfer of “static data” which is location data.

The structure of these messages is defined by the United Nations (UN).

6.1 Specification of SKDUPD and TSDUPD

The messages SKDUPD and TSDUPD are specified in Technical Document B.4. This document describes the message structure and its data content.

B.4 allows a variety of different ways to codify a train and its data. To simplify the use of these messages, the following sections of this chapter will give a practical guide to the most relevant details of the messages and describe a recommended way to use them.

Only those structures that are necessary and sufficient to fulfil the TAP obligations will be considered.

6.2 General introduction to EDIFACT data deliveries

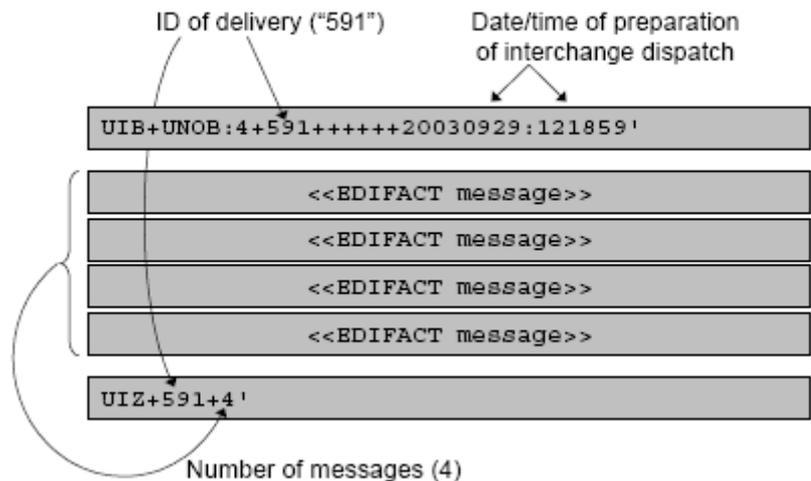
EDIFACT is a text based data format (not a binary one), though the syntax is not pleasant to read. EDIFACT data transfer is structured into a hierarchical way:

Each data transfer contains one or more messages. It starts with an UIB segment which specifies the EDIFACT syntax version used and gives the delivery ID.

It ends with an UIZ segment: a reference to the delivery ID and a count of the messages contained in the delivery.

Each message consists of several segments.

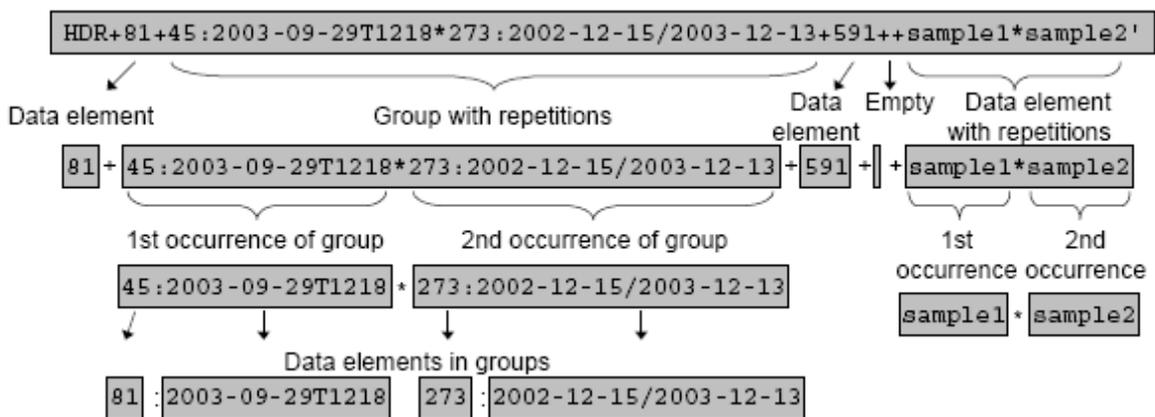
A segment is an EDIFACT structure element which begins with a three-letter key and ends with an apostrophe <'> as delimiter character.



A message contains data elements or groups of data elements. These data elements or groups of data elements are separated by a plus character <+>. Such data elements or groups of data elements can be repeated. The different repetitions are separated from each other by asterisks <*>. The data elements within a group are separated by a double dot <:>.

Data elements within a group cannot be repeated.

- Data elements and data groups of a segment: separation by plus character.
- Data elements and data groups of a segment: repetitions separated by asterisk.
- Data elements of data groups: separation by double dot.



EDIFACT, hierarchical data structures

6.3 Usage of SKDUPD

Summary of the segments used in SKDUPD and corresponding abbreviations

ASD	Service details
DTI	Date and time information
ERI	Application error information (*)
FRQ	Frequency
HDR	Header information
IFT	Interactive free text
MES	Measurements
MSD	Message action details
ODI	Origin and destination details
ORG	Originator of request details
PDT	Product information
POP	Period of operation
POR	Location and/or related time information
PRD	Product identification
RFR	Reference
RLS	Relationship
SER	Facility information
TCE	Time and certainty
TFF	Tariff information
TRF	Traffic restriction details
UIH	Interactive message header
UIT	Interactive message trailer
(*)	currently not used

6.3.1 Basic principles of train variants

6.3.1.1 Minimum representation of a train

In the following examples, details given include facilities, information about reservation and pricing and information about stops with traffic restrictions.

Please note: The available facilities on a train have to be given explicitly in the message.

Facts / situation	EDIFACT
A train (no service mode is specified) with number 596 and the service provider DB AG (1080).	PRD+596+1080'
The operation days are December 15th, 16th, 17th, 18th and 20th (but not 19th).	POP+273:2003-12-15/2003-12-20::111101'
Facility First class available	SER+4'
Facility Second class available	SER+5'
from Munich (008020347) dep. 12:34	POR+008020347+*1234'
via Frankfurt (008011068) arr. 16:08, dep. 16:13	POR+008011068+1608*1613'

to Berlin Ostbahnhof (008007817) arr. 20:33.	POR+008007817+2033'
--	---------------------

6.3.1.2 days of operation

Facts / situation	EDIFACT
Days of operation can be given with a list of 1's and 0's (1 means "train operates"). In this case the number of days within the given period has to be equal to the number of given 0 and 1 (e.g. the period 2003-12-15/2003-12-20 needs to be specified by 6 digits 0 and 1).	PRD+596+1080' POP+273:2003-12-15/2003-12-20::111101' SER+4' SER+5' POR+008020347+*1234' POR+008011068+1608*1613' POR+008007817+2033'

6.3.1.3 Service mode / service brand

Facts / situation	EDIFACT
<p>There are two levels for the specification of the travel service: the first one is the service mode in PRD segment. The service mode is mandatory when the mean of transport is not train (Service mode 37, which is the default).</p> <p>The second level is optional and specifies the service brand. This information is delivered in the PDT segment.</p> <p>Both levels codes are in the same code list B.4.7009. Codes from 3 through 37 design service modes, the codes from 47 upwards design service brand codes.</p> <p>The example on the right uses the code value 51 to indicate that the train is an ICE.</p>	PRD+596:::37+1080' POP+273:2003-12-15/2003-12-20::111101' PDT++:::51' POR+008020347+*1234' POR+008011068+1608*1613' POR+008007817+2033'

Given the subtle difference between the service mode and the service brand, and the fact that both use codes belonging to code list B.4.7009, it is useful to provide additional practical examples.

The minimum level is:

Facts / situation	EDIFACT
Service 596 provided by DB. Since Service mode is not specified, this service is a train.	PRD+596+1180'

The next level would be to explicitly define the service as a train:

Facts / situation	EDIFACT
Service 596, a train, provided by DB	PRD+596:::37+1180'

Adding a service brand gives an even better description of the service:

Facts / situation	EDIFACT
Service 596, provided by DB. Since Service mode is not specified, this service is a train	PRD+596+1180'
Service brand: Intercity	PDT+63'

Explicitly defining the service as a train and specifying the service brand:

Facts / situation	EDIFACT
Service 596, a train, provided by DB	PRD+596:::37+1180'
Service brand: Intercity	PDT+63'

An even more detailed description classifies this train as an intercity train, which is a generic term (not necessarily identical to the service brand "Intercity"):

Facts / situation	EDIFACT
Service 596, an intercity train, provided by DB	PRD+596:::9+1180'
Service brand: Intercity	PDT+63'

The trains using the service brand "Eurocity" are also classified as intercity trains:

Facts / situation	EDIFACT
Service 696, an intercity train, provided by DB	PRD+696:::9+1180'
Service brand: Eurocity	PDT+50'

If the service is not a train, it is mandatory to use data element 7009:

Facts / situation	EDIFACT
Service 596, a bus, provided by DB	PRD+596:::32+1180'

A more detailed description of a replacement bus:

Facts / situation	EDIFACT
Service 596, a bus, provided by DB	PRD+596:::32+1180'
Service brand: Replacement bus	PDT+162'

NB : it must be avoided using contradictory descriptions such as:

Facts / situation	EDIFACT
Service 596, provided by DB, a train by default	PRD+596+1180'

Service brand: Replacement bus, which is not a train	PDT+162'
--	----------

6.3.2 Service relationships

For international services, the association descriptions chosen by the different affected railways must be consistent. An international train may not be displayed from one railway as a service number change and from the other railway as a coach group.

It must be noted that associations are between schedules rather than between physical trains.

For example, for a connection to schedule A100 valid every day of the week there may be two A100 schedules, one for the Monday- Friday, and the other for Saturday-Sunday. When a relationship says that the association to schedule A100 happens at location X, then X must be in schedule A100 itinerary (not in a schedule connected to A100).

6.3.2.1 Coach groups attached to trains

Coach groups do not run independently. They need a train to which they are coupled. A coach group can add only very distinct information to a train, which are in detail:

- information of a service-, information- or reservation provider who is assigned only to the coach group,
- a running period (effectively a subset of the period of the trains to which the coach group is coupled),
- special facilities and services,
- references to the trains, i.e. the information that this coach group is coupled to several trains.

All other information is defined in the train data record itself and is inherited by the coach group from the train. A coach group has no own arrival or departure times, no special platform information, no additional stops.

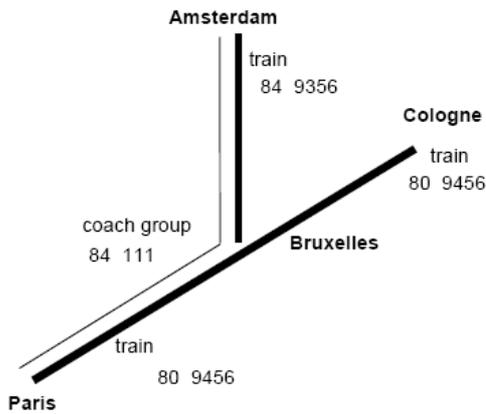
The itinerary of a coach group in SKDUPD is restricted to the stops where it is coupled to, or disconnected from, a train, and to the stops where special facilities or services are added to, or removed from, the coach group schedule. The reference of a coach group to the train(s) to which it is coupled, is a “connect to”-reference.

The reference is unidirectional: a train does not reference the coach groups which are coupled to it.

The trains do not inherit any of the properties of the coach group. When calculating the travel advice the coach group data have to be attached to the given pulling trains. While attaching the coach group to the referenced pulling train it must be ensured that the connection date/time, connection station code and the connecting train number match this information from the referencing coach group.

Facts / situation	EDIFACT
Service Number 111, which is a coach group (31) from NS (84)	PRD+111:::31+1184'

days of operation	POP+273:2003-12-15/2003-12-20::111101'
start station: Amsterdam (without time)	POR+8400058'
with train 9356 from NS	RFR+AUE:9356:::1184'
84 111 connects to (6) 84 9356 in Amsterd.	RLS+13+6'
- changing station Bruxelles	POR+8814001'
to train 9456 from DB	RFR+AUE:9456:::1080'
84 111 connects to (6) 80 9456 in Bruxelles	RLS+13+6'
- destination station: Paris	POR+8727100'

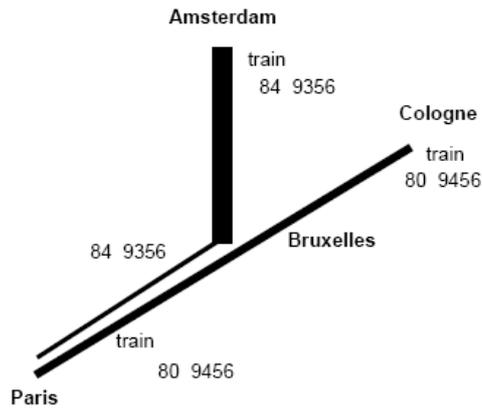


train 80 9456 Cologne – Paris
 train 84 9356 Amsterdam – Bruxelles
 through coach 84 111 Amsterdam – Paris

At 21:05 In Paris arrives one train 9456 from Cologne with through coaches (Kurswagen) from Amsterdam

6.3.2.2 Joining to

Facts / situation	EDIFACT
train (37) 9356 from NS (84)	PRD+9356:::37+1184'
days of operation	POP+273:2003-12-15/2003-12-20::111101'
start station: Amsterdam	POR+8400058+*1656'
stop at Bruxelles	POR+8814001+1935*1943'
joins (8) train 80 9456	RFR+AUE:9456:::1080
to go together	RLS+13+8'
to Paris	POR+8727100+2105'

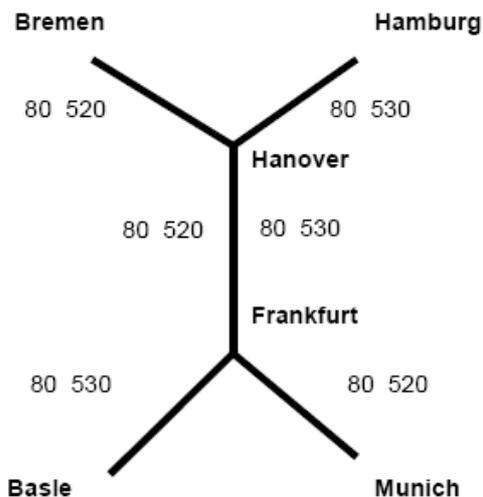


train 80 9456 Cologne – Paris
 train 84 9356 Amsterdam – Paris

At 21:05 In Paris arrive two trains: 9456 from Cologne and 9356 from Amsterdam

6.3.2.3 Joining to, splitting from

Facts / situation	EDIFACT
Service Number 530, which is a train (default) from DB AG (1080)	PRD+530+1080'
days of operation	POP+273:2003-12-15/2003-12-20::111101'
start station: Hamburg	POR+008001071+*0824'
in Hanover	POR+008013552+0939*0942'
is joining with (8)above train 80 520	RFR+AUE:520:::1080'
in Frankfurt	RLS+13+8'
is splitting from (11) above train 80 520	POR+008011068+1200*1205'
destination station: Basel	RFR+AUE:520:::1080'
Between Hannover and Frankfurt both trains run under different numbers combined with the same times.	RLS+13+11' POR+008500010+1455'



train 80 520 Bremen – Munich
 train 80 530 Hamburg – Basle

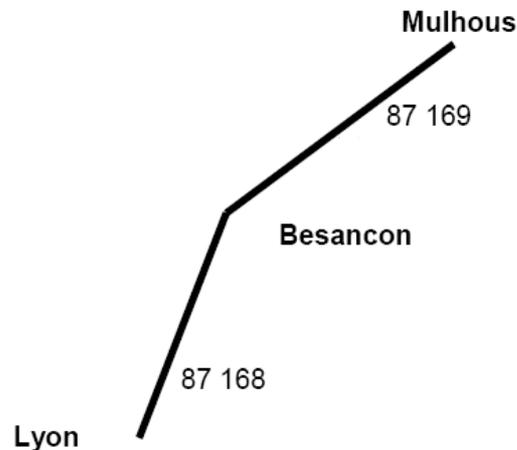
At 12:00 in Frankfurt arrive two trains, 520 and 530, from Hanover at the same time

While joining a train to the referenced other one it must be ensured that the connection date/time, connection station code and the connecting train number match these information from the referencing train. Same is applicable for splitting.

6.3.2.4 Connecting to

Facts / situation	EDIFACT
Service Number 168, which is a train (37) from SNCF (1187)	PRD+000168:::37+1187
days of operation	POP+273:2003-12-15/2003-12-20::111101'
start station: Lyon	POR+008772202+*1434
- is connecting (6) at station Besancon Viotte to service number to train 87 169	POR+008771800+1717 RFR+AUE:000169:::1187 RLS+13+6
Service Number 169, which is a train (37) from SNCF (1187)	PRD+000169:::37+1187
days of operation	POP+273:2003-12-15/2003-12-20::111101'
start station: Besancon Viotte	POR+008771800+*1719
destination station: Mulhouse.	POR+008718206+1900

Train 168 will run from Besancon Viotte as train 87 169. The first station of the second train has to be the same station as the last station of the first train



The difference towards the following “Service number change” is that, in case of “Connecting to”, the composition of the train can change.

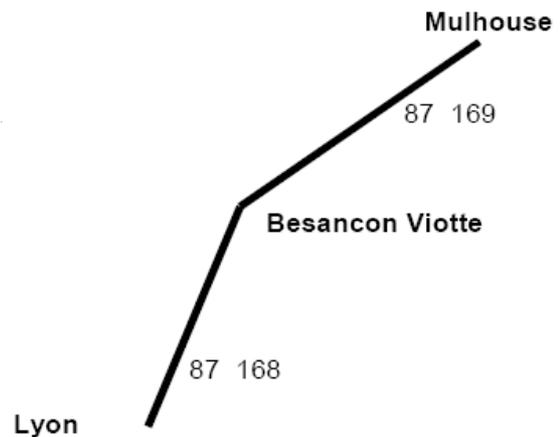
While connecting a train to the referenced other one it must be ensured that the connection date/time, connection station code and the connecting train number match these information from the referencing train.

6.3.2.5 Service number change

Facts / situation	EDIFACT
Service Number 168, which is a train (37) from SNCF (1187)	PRD+000168:::37+1187
days of operation	POP+273:2003-12-15/2003-12-

	20::111101'
start station: Lyon	POR+008772202+*1434
at station Besancon Viotte	POR+008771800+1717
is changing (12) the service number to train 87 169	RFR+AUE:000169:::1187RLS+13+12
Service Number 169, which is a train (37) from SNCF (1187)	PRD+000169:::37+1187
days of operation	POP+273:2004-03-13/2004-03-28::1111...
start station: Besancon Viotte	POR+008771800+*1719
- destination station: Mulhouse	POR+008718206+1900

Train 168 will run from Besancon under a new number. The first station at the second train has to be the same station as the last station of the first train.



The difference towards the previous “Connecting to” is that, in case of “Service number change”, the composition of the train cannot change.

While changing the service number of a train to the referenced other one it must be ensured that the connection date/time, connection station code and the connecting train number match these information from the referencing train.

6.3.2.6 Connecting - Timing between services

Facts / situation	EDIFACT
An EC 90 is running from MILANO C.LE to LUXEMBOURG.	PRD+00090:::37+0083**1185' POP+273:2003-12-15/2003-12-20::111101' PDT++:::50' POR+008301700+*0810' POR+008507000+1156*1204' POR+008721202+1444*1446'
At station LUXEMBOURG the passenger has the possibility to change (code 7, code table B.4.9143, ERA Directory of Passenger Code Lists) to train 2896 (service provider CFL=0082) direction KOELN HBF. The connection is normally guaranteed (code X02, code table B.4.4049, ERA Directory of Passenger	POR+008200100+1650' RFR+AUE:2896:::0082' RLS+13+7' TCE+4+X02'

Code Lists) in 4 minutes.	
The regional train 2896 leaves LUXEMBOURG at 16:54 direction KOELN HBF.	PRD+2896:::37+0082' POP+273:2003-12-15/2003-12-20::111101' PDT++:::84' POR+008200100+*1654' POR+008015458+1820'

The codes of code table B.4.4049 represent special cases of connection certainty/uncertainty, based on comparison of the connection time available (CTA, interval between scheduled arrival of the first train and scheduled departure of the second) and the minimum connection time in that station (MCT).

When no code is used, the connection is normally guaranteed if $CTA \geq MCT$ and not guaranteed if $CTA < MCT$.

Code X02 means that the connection is normally guaranteed, even though $CTA < MCT$ (e.g. when the second train always leaves from the same platform where the first arrives). Code X03 means that the connection is normally not guaranteed, even though $CTA \geq MCT$ (e.g. when the first train has often delays).

Codes 1 and X04 mean that the connection is respectively always guaranteed or not, independently from the comparison between CTA and MCT.

Coach groups schedules do not have connecting times, they depend only on the trains!

6.3.3 Details of services

6.3.3.1 Stops with traffic restrictions

For a 'boarding only' stop an arrival time is not necessary, nor is the departure time necessary for a 'alighting only' stop, for a 'technical' stop no time at all is necessary when designated as "passage".

A schedule may start and/or end at a location that is a technical stop.

Facts / situation	EDIFACT
InterCityExpress 596 is running from Munich (008020347) to Berlin Ostbahnhof (008007817). If traffic restrictions apply to the service (it is not possible to enter or leave the train at certain stops) this information is delivered in special data elements:	PRD+596:::37+1080' POP+273:2003-12-15/2003-12-20::111101' PDT++:::51' POR+008020347+*1234'
The station Stuttgart (008029034) is open for boarding only.	POR+008029034+1447*1451' TRF+1'
The station Frankfurt/Main (008011068) is a technical stop, not to be published, no	POR+008011068+1608*1613' TRF+3'

boarding or alighting.	
The station Fulda (008005637) is open only for alighting.	POR+008005637+1710*1712' TRF+2'
The station Braunschweig (008013241) is a stop only by request.	POR+008013241+1858*1900++230'
Destination station Berlin Ostbahnhof	POR+008007817+2033'

6.3.3.2 Overnight trains

Arrival and departure times are given with values between 00:00 and 23:59!
00:00 o'clock is the first time at the new day.

Facts / situation	EDIFACT
An InterCityNotte (brand code 96) with number 1520 is running from ROMA TIBURTINA (008308217) via FIRENZE C.M. (008306900) to MILANO C.LE (008306900). The train arrives at FIRENZE C.M one day after the departing from the previous stop (Rome). The first time of the new day has to be marked with a date variation number 1.	PRD+1520:::37+0083' POP+273:2003-12-15/2003-12-20::111101' PDT++:::96' POR+008308217+*2223' POR+008306900+0235:::1*0240' POR+008301700+0615'
Each time an arrival or departure time "crosses" midnight it has to be marked with a date variation number 1. The example shows a departure time after arriving time the day before.	PRD+1520:::37+0083' POP+273:2003-12-15/2003-12-20::111101' PDT++:::96' POR+008308217+*2223' POR+008306900+2350*0010:::1' POR+008301700+0615'
00:00 o'clock is the first time at the new day. It has to be marked with a date variation number 1.	PRD+1520:::37+0083' POP+273:2003-12-15/2003-12-20::111101' PDT++:::96' POR+008308217+*2223' POR+008306900+2350*0000:::1' POR+008301700+0615'

6.3.3.3 Time zone crossings

Arrival and departure times are given in local times!

Facts / situation	EDIFACT
An international train (brand code 68) with number 310 is running from Fuentes de Oñoro (007133016) dep. 06:36 to Vilar Formoso (009449460) arr. 05:40. The	PRD+310:::37+1094' POP+273:2003-12-15/2003-12-20::111101' PDT++:::68'

times are given in local times, although the times are descending. All stations in TAP/TAF Locations Common Reference Database (CRD) are dedicated to a time zone, thus the correct duration can be calculated. In this example the train is running 4 minutes.	POR+007133016+*0636' POR+009449460+0540'
If the arrival time is one day before the departure time the “date variation number” is set to -1.	PRD+310:::37+1094' POP+273:2003-12-15/2003-12-20::111101' PDT++:::68' POR+007133016+*0013' POR+009449460+2350::-1'

6.3.3.4 Pricing and reservation details

Facts / situation	EDIFACT
TGV Sud-Est (code 73) number 9261 from service provider SNCF (1187) is running from PARIS GARE DE LYON (008768600) to LAUSANNE (008501120). To access this train, a reservation is compulsory and it is booked via global price (IRT). This is indicated in the PRD segment with 13 (reservation compulsory) and 2 (global price) in the appropriate data elements.	PRD+9261:13:2:37+1187' POP+273:2003-12-15/2003-12-20::111101' PDT++:::73' POR+008768600+*0744' POR+008501120+1137'
Price and reservation details on sections of the itinerary – The global price (code 2) including reservation compulsory (code 13) are valid from stop 1 to stop 2. The TCV (NRT) price (code 1) including No reservation (code 19) is valid from stop 2 to stop 3.	PRD+9261:::37+1187' POP+273:2003-12-15/2003-12-20::111101' POR+008768600+*0744' POR+008501120+1137*1139' POR+008501121+1156*' ODI+008768600*008501120+1*2' PDT++13:::73:::2' ODI+008501120*008501121+2*3' PDT++19:::73:::1'

When a service is offered for international or foreign sale it is essential to indicate the pricing system, because this allows to look in the corresponding tariff data to determine the fare(s) at which the service can be sold (see Appendix B of the Tariffs Implementation Guide)

6.3.3.5 Information provider

If there is one railway responsible for delivering data for a complete train this responsible railway can be specified in the message as information provider. Nevertheless an alternative preferable method to indicate who is the provider for a train will be a central registry, procured by the Governance Entity – see chapter 9.2.4

Facts / situation	EDIFACT
TGV Sud-Est 9261 from service provider SNCF (the first appearance of 1187) is running from PARIS GARE DE LYON to LAUSANNE. The information provider for this is SNCF (second appearance of 1187), no other deliveries for this train will be taken into account. (The third appearance of 1187 indicates that SNCF is also the reservation provider, see next section.)	PRD+009261:13:2:37+1187*1187*1187' POP+273:2003-12-15/2003-12-20::111101' PDT++:::73' POR+008768600+*0744' POR+008501120+1137'

6.3.3.6 Reservation provider

This field is to fill in with the code of the railway company, which is responsible for the reservation of this train (whole itinerary). Every international train can be booked via one reservation system.

Facts / situation	EDIFACT
An EC number 90 from service provider FS (0083) runs from MILANO C.LE via BERN and STRASBOURG VILLE to LUXEMBOURG. If SBB responsible for the reservation system which enables booking of this train, it could be specified with code value 1185 for reservation provider SBB.	PRD+00090:::37+0083**1185' POP+273:2003-12-15/2003-12-20::111101' PDT++:::50' POR+008301700+*0810' POR+008507000+1156*1204' POR+008721202+1444*1446' POR+008200100+1650'

6.3.3.7 Service Facilities

The facilities of a train have to be given explicitly in the message. The data harmonisation/ quality requirements from TAP TSI chapter 4.2.18 must be strictly applied for trains where multiple service providers are involved, e.g. cross-border trains or trains with coach groups.

Facts / situation	EDIFACT
Table B.4.9039 of ERA Directory of Passenger Code Lists gives a list of all possible service facilities. EC 90 provides a restaurant (code 9).	PRD+00090:::37:::Vauban+0083**1185' POP+273:2003-12-15/2003-12-20::111111' PDT++:::50' SER+9'
The train runs from MILANO (008301700) via BERN (008507000) and STRASBOURG (008721202) to LUXEMBOURG (008200100).	POR+008301700+*0810' POR+008507000+1156*1204' POR+008721202+1444*1446' POR+008200100+1650'
Bicycle transport (code 26) is available	ODI+008507000*008200100+2*4'

only from BERN (stop index 2) to LUXEMBOURG (stop index 4).	SER+26'
The first class facility (code 4) is available only from MILANO (stop index 1) to STRASBOURG (stop index 3) Friday and Saturday (weekdays 5 and 6).	ODI+008301700*008721202+1*3' SER+4+++273:2003-12-15/2003-12-20+56'

6.3.3.8 Service extras

Facts / situation	EDIFACT
Table B.4.7161 of ERA Directory of Passenger Code Lists gives a list of all possible service extras.	PRD+00090:::37+0083**1185' POP+273:2003-12-15/2003-12-20::111111' PDT++:::50'
EC 90 provides trolley service (code 25).	ASD+25'
The train runs from MILANO (008301700) via BERN (008507000) and STRASBOURG (008721202) to LUXEMBOURG (008200100).	POR+008301700+*0810' POR+008507000+1156*1204' POR+008721202+1444*1446' POR+008200100+1650'
Meal at the seat (code 38) is served only from BERN (stop index 2) to LUXEMBOURG (stop index 4).	ODI+008507000*008200100+2*4' ASD+38'
Service for business people (code 29) is available only from MILANO (stop index 1) to STRASBOURG (stop index 3) Monday till Thursday (weekdays 1 to 4).	ODI+008301700*008721202+1*3' ASD+29+273:2003-12-15/2003-12-20+1234'

The data harmonisation/ quality requirements from TAP TSI chapter 4.2.18 must be strictly applied for trains with multiple information providers.

6.3.3.9 Stops for the NRT - series

These stops are used to associate a particular schedule with a particular NRT series in TD B.1. Where they are necessary for the identification of this association, their inclusion is mandatory.

The data harmonisation/ quality requirements from TAP TSI chapter 4.2.18 must be strictly applied for trains with multiple information providers.

Facts / situation	EDIFACT
An IC 90 runs from BERLIN ZOO to HAMBURG HBF without any intermediate stop. Departure station BERLIN ZOO	PRD+00090:::37+1185**1185' POP+273:2003-12-15/2003-12-20::111101' PDT++:::63' POR+008003036+*0810'

If the train runs via Wittenberge, the station WITTENBERGE has to be included with the passing time in the itinerary of the train (code 92). The train do not stop at this station – passage (code 4).	POR+008027317+0900++92' TRF+4'
Arrival station HAMBURG HBF	POR+008001071+1050'

6.3.3.10 Border stations for the NRT – series

See chapter 6.3.3.9. The same is true for border stations.

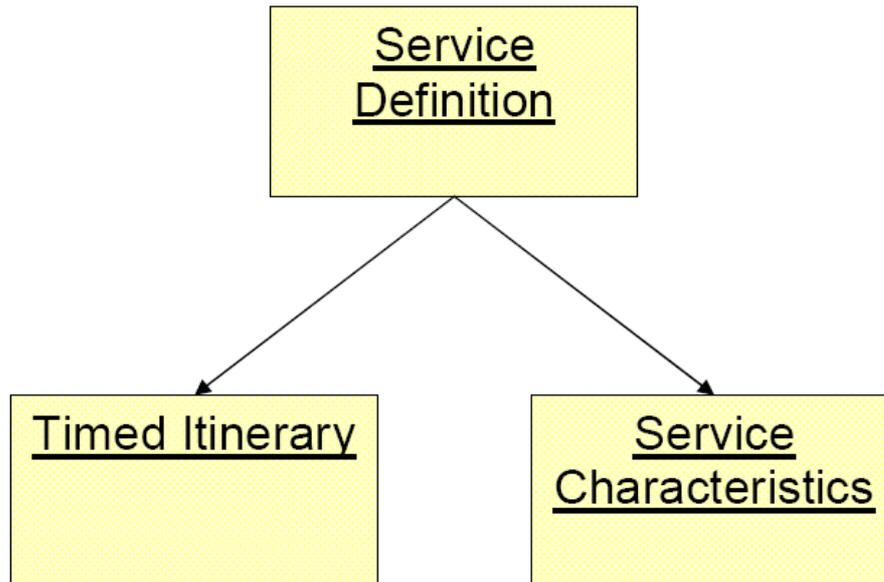
Facts / situation	EDIFACT
EC 90 from runs from KARLSRUHE HBF to STRASBOURG VILLE.	PRD+00090:::37+0083**1185' POP+273:2003-12-15/2003-12-20::111101' PDT++:::50'
Departure station KARLSRUHE HBF	POR+008014228+*0810'
The station Kehl (Gr) is indicated as a border station (code 17). That's the border station in the DB file TCVS according to B.1. The train does not stop at this station – passage (code 4).	POR+008014296+1000++17' TRF+4'
The station Kehl (Gr) is indicated as a border station (code 17). That's the border station in the SNCF file TCVS according to B.1. The train does not stop at this station – passage (code 4).	POR+008721291+1000++17' TRF+4'
Arrival station STRASBOURG VILLE.	POR+008721202+1020'

6.4 SKDUPD full example

The following is an example of a SKDUPD schedule. It was constructed so as to illustrate as many of the message elements as possible, using fictitious RUs and locations.

Broadly speaking, a TAP schedules definition can be seen as composed of:

- Service Definition (Identification, reservation status, companies involved, etc)
- Service Characteristics (service type, coach-types, extra services)
- A timed itinerary



Object Schedule Definition

6.4.1 Single Variation

The SKDUPD files are lists of Schedules Definitions as shown in above Figure.

Multi-variation schedules should not be used for SKDUPD. Multi variation means, that the wide range of data elements should be used to avoid more service variants than necessary. Example: If there is a facility not valid on some operation days of the train, then this would not need a new train variant. It is possible to use in this case the extra operation days for the effected facility.

If possible, one service should be described in a single variation, i.e. one POP segment:

PRD One service
 PDT Service brand applicable for the complete service, but possibly limited days of operation
 ASD Services applicable for the complete service, but possibly limited days of operation
 ...
 SER Facilities applicable for the complete service, but possibly limited days of operation
 ...
 POP First and only variant, i.e. a single variant
 POR
 ...

This can be accomplished by:

- Using the E013 (Date and time information) composite element in the ASD and SER segments to describe when an extra (ASD) or facility (SER) is available.
- Using the ODI segment to describe service brands (PDT), extras (ASD) and facilities (SER) that are limited to some of the travel segments.

Some situations require multiple variations, e.g.

The train service operates A-B-C-D-E Monday-Friday but only A-B-C Saturday-Sunday:

PRD One service
PDT
POP 1111100... First variation Monday-Friday
POR A
POR B
POR C
POR D
POR E
POP 0000011... Second variation Saturday-Sunday
POR A
POR B
POR C

The train service has different traffic restrictions, e.g. stops for boarding and alighting Monday-Friday but stops only for boarding Saturday-Sunday:

PRD One service
PDT
POP 1111100... First variation Monday-Friday
POR A
POR B
POR C
POP 0000011... Second variation Saturday-Sunday
POR A
POR B
TRF 1 Boarding only at B
POR C

The train has different arrival or departure times during the timetable year or the train has different arrival or departure times during the week:

PRD One service
PDT
POP 1111100... First variation Monday-Friday
POR A 1200
POR B 1258*1300
POR C 1400 Arrives at C 14.00
POP 0000011... Second variation Saturday-Sunday
POR A 1200
POR B 1258*1300
POR C 1410 Arrives at C 14.10

The train runs through two or more time zones where winter and summer time changes are not coordinated (see also chapters 6.5.2.6 and 6.5.2.7). For example, Poland is observing daylight saving time (summer time) between 25 March 2012 and 28 October 2012, whereas Belarus is not:

PRD+116::1+1251'	One service
POP+273:2011-12-11/2012-03-24::11111111111111...	First variation
POR+005103610+*2052'	
POR+005104099+2356*0036:::1'	Terespol is UTC+1, i.e. departure 23.36 UTC
POR+002113000+0322'	Brest is UTC+3, i.e. arrival 00.22 UTC
POP+273:2012-03-25/2012-10-28::11111111111111...	Second variation
POR+005103610+*2052'	
POR+005104099+2356*0036:::1'	Terespol is UTC+2, i.e. departure 22.36 UTC
POR+002113000+0222'	Brest is UTC+3, i.e. arrival 23.22 UTC
POP+273:2012-10-29/2012-12-08::11111111111111...	Third variation
POR+005103610+*2052'	
POR+005104099+2356*0036:::1'	Terespol is UTC+1, i.e. departure 23.36 UTC
POR+002113000+0322'	Brest is UTC+3, i.e. arrival 00.22 UTC

The following example is for a single Variation and the Service Characteristics are given at Level 3.

6.4.2 EDIFACT format

PRD+22202:14:1:37:::Bernard Buffet+0098*0098*0099'	Companies, schedule identification
RFR+AVI:2220'	Schedule published Id
POP+273:2008-01-31/2008-02-06::1011111'	Period of operation
PDT++:::63'	Service Brand
ASD+25:0930:1600+273:2008-01-31/2008-02-06::1111101'	Extras
SER+26'	Facilities
SER+4:::13++3+273:2008-01-31/2008-02-06::1110111'	Facilities
ASD+38:1130:1400:::13+273:2008-02-01/2008-02-06::111000'	Facility's Extra
POR+009827100+*0900:0845'	Locations
POR+009814001+0947*0952'	
POR+009814002+*1020+*1'	
TRF+1'	Boarding only
POR+009821006+1115*1118'	
POR+009800530+1136*1138'	
POR+009800531+1156'	
TRF+2'	Alighting only
POR+009800532+1230++92'	Routing station with passing time
TRF+4'	Passage, non-stop

POR+009800280+1256*1258'	
POR+009814296+1330++17'	First border station with passing time
TRF+4'	
POR+009947111+1330++17'	Second border station with passing time
TRF+4'	
POR+009900561+1519*1521'	
POR+009900562+1920*1923'	
POR+009900566+2220*2222'	
POR+009900563+0120:::1*0123'	Day-change
POR+009900058+0738'	
RFR+AUE:22203:::0099'	Association (service number change)
RLS+13+12'	
ODI+009814002*009900561+3*11'	Itinerary segments
SER+9'	
ODI+009827100*009900562+1*12'	
SER+5'	
ODI+009900562*009900058+12*15'	
SER+7	

6.4.3 Travel service definition

PRD+22202:14:1:37:::Bernard Buffet+0098*0098*0099
RFR+AVI:2220'

The service number of this train is 22202, the characteristic description code (reservation status) is "14" (reservation advised), the product characteristic identification code (pricing brand) is "1" (TCV) and the service mode is "37" (train).

6.4.3.1 Companies

Service Provider Id	PRD	0098	This is the entity responsible for the terms and conditions and for the fares valid on the service and is often identical with the operating carrier. .
Information Provider Id	PRD	0098	The service operator mentioned here gives the complete data for the whole itinerary for that service (see also 6.3.3.5).
Reservation company Id	PRD	0099	RU hosting the given service in its attributing system. Use code list B.4.3039.

6.4.3.2 Schedule Identification

Service number	PRD	22202	Each schedule is identified by a combination of operator Id and service number. (segment PRD/record S001).
Service publishable number	RFR	2220	For some services, the published service number is different to the service number used in SKDUPD as identification. (RFR/SR01)

		By using this, different services may be published with the same number.
--	--	--

6.4.3.3 Other service elements

Reservation Status code	PRD	14 (Reservation advised)
Pricing Category code	PRD	1 (TCV)
Service Mode code	PRD	37 (train)
Service Name	PRD	“Bernard Buffet”

6.4.4 Variation

6.4.4.1 Period of operation

POP+273:2008-01-31/2008-02-06::1011111'

The example gives a service that runs daily from 2008-01-31/2008-02-06 but does not run on the 1st of February.

Period	POP	2008-01-31/2008-02-06
Period Days	POP	1011111
Date/period code	POP	273

6.4.4.2 Service Characteristics

PDT++:::63'
ASD+25:0930:1600+273:2008-01-31/2008-02-06::1111101'
SER+26'
SER+4:::13++3+273:2008-01-31/2008-02-06::1110111'
ASD+38:1130:1400:::13+273:2008-02-01/2008-02-06::111000'

6.4.4.3 Service Brand

Service Brand	PDT	63 (Intercity)
---------------	-----	----------------

The service brand defined here is valid on the whole part of the itinerary – service brands valid only on a part of the itinerary have to be defined in the ODI-PDT segments.

6.4.4.4 Extras

In addition to availability dates, availability times can be specified for extras.

Extra code	ASD	25 (Trolley service)
Extra service start time	ASD	09:30
Extra service end time	ASD	16:00
Period of availability	ASD	2008-02-01/2008-02-06
Days of availability	ASD	1111101

Date/period code	ASD	273
------------------	-----	-----

6.4.4.5 Facilities

The first facility describes a bicycle transport.

Facility code	SER	26 (bicycle transport)
---------------	-----	------------------------

The second facility describes a coach-type (first class seats) for which there is an 'Extra', (meals served at the seat, subject to reservation).

Extra code	ASD	38 (Meal at the seat)
Reservation Status	ASD	13 (compulsory reservation)
Extra service start time	ASD	11:30
Extra service end time	ASD	14:00
Time Span	ASD	2008-02-01/2008-02-06
Date/period code	ASD	273
Working week	ASD	567 (Friday, Saturday, Sunday)

In this example is shown the use of the "working week" to indicate the days of operation of a service. Nevertheless, the same result can be achieved with the use of the "Days of operation" (see 6.3.1.2), and this latter method is much more flexible since it allows to define any combination of days, not only a weekly repetition. Therefore, to facilitate the work of the data users, it is recommended to never use the "working week" notation.

6.4.5 Locations

6.4.5.1 Departure location

POR+009827100+*0900:0845'

Location Id	009827100	No arrival time is shown at the first departure. Note that the first departure may not be the first location in the schedule: it may be, for instance, a border station.
Departure Time	09:00	
Passenger Departure Time	08:45	The departure may also give a 'passenger departure time'. This is the published departure time, which may be different to the real departure time.

6.4.5.2 Intermediate locations

Intermediate locations are expected to show both arrival and departure time, but exceptions are allowed depending on the location function and/or restriction.

POR+009814002+*1020+*1'
TRF+1'

POR+009800531+1156'
TRF+2'

Location Id	009814002	
Arrival Time	none	The arrival time is not specified as the passengers cannot leave the train.
Departure Time	10:20	
Departure platform	1	The train leaves at platform 1.
Location Restriction code	1 (boarding only)	

Location Id	009800531	
Arrival Time	11:56	
Departure Time	none	The departure time is not specified as the passengers cannot board the train
Location Restriction code	2 (alighting only)	

POR+009800532+1230++92'
TRF+4'

Location Id	009800532	
Arrival Time	12:30	Passing time must be indicated
Departure Time	none	
Location Function code	92	routing
Location Restriction code	4	passage

6.4.5.3 Day change

POR+009900563+0120:::1*0123'

Location Id	009900563	
Arrival Time	01:20	
Arrival Day Change code	1 (Over-midnight)	Each time given in the schedule is latter than the time preceding it. 'Day change' flags are used in the message to indicate that the apparent break of this rule is legitimate (travel over midnight, change of time-zone).
Departure Time	01:23	

6.4.5.4 Location extras

The SKDUPD schedule may contain the description of extras services for particular locations. These services are restricted to loading/unloading of vehicles.

No example will be given.

6.4.5.5 Association

RFR+AUE:22203:::0099'
RLS+13+12'

Service Operator Id	RFR	0099	Of the associated service
Service number	RFR	22203	idem
	RLS	13	association
Relationship code	RLS	12	Kind of association (<i>change of id.</i>) A schedule association may be declared to happen at particular locations. When this association is a change of identity, as in the example, it can only occur at the last location.

The association gives a reference to all service variants (schedule variants) having service operator id "0099", service number "22203" which depart at the location 009900058.

6.4.6 Itinerary Segments

The itinerary segments record allow for the description of the service elements that are available for only part of the journey. They are mostly used for the description of facilities.

Note that defining a segment equal to the whole itinerary, gives yet another way to specify facilities and extras valid for the whole schedule.

ODI+009814002*009900561+3*11'
SER+9'
ODI+009827100*009900562+1*12'
SER+5'
ODI+009900562*009900058+12*15'
SER+7'

Location Id	ODI	009814002
Location Id	ODI	009900561
Location sequence number	ODI	3
Location sequence number	ODI	11
Facility code	SER	9 (Restaurant car)

Location Id	ODI	009827100
Location Id	ODI	009900562
Location sequence number	ODI	1
Location sequence number	ODI	12
Facility code	SER	5 (2nd class seats)

Location Id	ODI	009900562
Location Id	ODI	009900058
Location sequence number	ODI	12
Location sequence number	ODI	15
Facility code	SER	7 (2nd class couchettes)

6.5 Locations data

The current version of TAP TSI requires that each RU publishes its timetable data in SKDUPD format together with station data in TSDUPD format. The stations provided in the TSDUPD file must be at least all stations referred to in the SKDUPD file.

In the following chapter 6.5.1 it is described how the TSDUPD file should be established in EDIFACT format.

But the TAP itself states, in chapter 4.2.19.1, that :

“For the operation of passenger trains on the European network, the following reference files must be available and accessible to all service providers (infrastructure managers, railway undertakings, authorised third parties and station managers). The data must represent the actual status at all times.

The European Railway Agency will centrally store and maintain unique codes for the following reference data:

...

— reference file of the coding of locations,”.

Since those locations data will be centrally stored, and will be commonly used by all IT applications needing them (also for freight and infrastructure domains), it seems illogical for each RU to reproduce at each timetable change a full set of locations data, including all attributes of the stations where they operate trains. This risks creating inconsistencies, especially considering that with the market liberalisation more than one RU would deliver data for the same station.

It has therefore been agreed that the locations database will be unique and centralised, procured by the Governance Entity, with different parts of the content defined by different actors (National Entities, Infrastructure Managers, Railway Undertakings) according to well defined governance rules.

When the locations database will be in place it will be possible to review the process, cancelling the need to make available the locations data in the TSDUPD files, and replacing this task with two steps:

- on one side the RUs together with the IMs and SMs will contribute, for the data in their competence domain, to keep the locations database up to date (“represent the actual status at all times”)
- on the other side, when making available their timetables in SKDUPD, the RUs will only have to make sure that all stations referred to in SKDUPD are present in the locations database with all necessary attributes.

It will also be possible for the Data Quality Management tool (see chapter 7.1) to perform all quality checks related to locations with reference to that database.

Currently the first instance of the locations database is being created as Common Reference Database (CRD) by the stakeholders implementing the TAF Regulation. Appendix C shows samples of the XML messages by use of which it is possible to obtain the content of the CRD.

In the following chapter 6.5.2 it is described how the CRD could satisfy, by use of the subsidiary locations principle, the same special needs of the timetable application whose EDIFACT solution is presented in 6.5.1.

6.5.1 Location data in TSDUPD format

Summary of the segments used in TSDUPD and corresponding abbreviations

ADS	Address (*)
ALS	Additional location information
ASD	Service details
CNY	Country information
CON	Contact information (*)
ERI	Application error information (*)
FRQ	Frequency
HDR	Header information
IFT	Interactive free text
LNG	Language
MES	Measurements
MSD	Message action details
NME	Name (*)
ORG	Originator of request details
POP	Period of operation
POR	Location and/or related time information
PRD	Product identification
RFR	Reference
RLS	Relationship
SER	Facility information
TIZ	Time zone information
TRF	Traffic restriction details
UIH	Interactive message header
UIT	Interactive message trailer
(*)	currently not used

The following examples give details of the necessary station data, and of the minimum data necessary to build a TSDUPD file, as long as this solution is still in place.

Facts / situation	EDIFACT
Station code 008102801 for station (code 29) name WIEN NORD with country code AT for Austria.	ALS+29+008102801:WIEN NORD' CNY+AT'

The following table gives an overview of the permitted combinations of location references.

Intersections and contradictories should be excluded.

Location A Function of the location (ALS/E975/3227) to which reference is made in segment RFR	Relationship code (RLS/E941/9 143)	Location B Function of the location defined in segment ALS (ALS/E975/3227)	Remarks
29 (station)	6 (pedestrian link)	29 (station)	Pedestrian link (from B to A)
29 (station)	14 (is part of)	26 (city/meta station)	A belongs to the grouping of locations B
29 (station)	14 (is part of)	29 (station)	A is a substation of B

- The location hierarchy defined in the table above consists of 3 levels:
 - substation (ALS/E975/3227 = 29)
 - (main) station (ALS/E975/3227 = 29)
 - grouping of stations (City) (ALS/E975/3227 = 26)
 A station cannot be at the same time „substation“ and „main station“, nor can it be at the same time „station“ and „grouping of stations (city)“.
- A grouping of stations (city) (ALS/E975/3227 = 26) cannot be referenced by trains.
- A grouping of stations (city) (ALS/E975/3227 = 26) cannot be referenced by (pedestrian) links.

6.5.1.1 Pedestrian link between two nearby stations

The aim of this function is to connect stations for the search algorithm in electronic travel information systems.

The traveller sometimes has to leave one station and get another train in a nearby station.

The time given for the pedestrian transfer should be enough for a traveller with luggage not familiar with the local geography.

The transfer time should be given in both directions (A to B and B to A).

Facts / situation	EDIFACT
Definition of the station (code 29) Eurostar terminal in Paris Nord	ALS+29+008727101:Paris Nord Eurostar'
Reference to Paris Nord Banlieue	RFR+AWN:008727103'
The time needed to transfer from Paris Nord Eurostar to Paris Nord Banlieue is 5 minutes	MES+5:MIN'
There is a (pedestrian) connection from Paris Nord Eurostar to Paris Nord Banlieue	RLS+13+6'

6.5.1.2 Definition of substations

A substation is a part of a station. For example, part of a station can be dedicated to high speed traffic, another to regional traffic and another to urban traffic.

The station Paris Nord has parts : Paris Nord Eurostar, Paris Nord Grandes Lignes and Paris Nord Banlieue.

Please notice that the specification of a substation does not include a possible pedestrian link. Normally you have to include an additional pedestrian link (in both directions) for a substation relation (see 6.5.2.1).

Facts / situation	EDIFACT
Definition of station (code 29) Paris Nord	ALS+29+008727100:Paris Nord'
Reference to Paris Nord Eurostar	RFR+AWN:008727101'
Paris Nord Eurostar is a child/part of Paris Nord (code 14)	RLS+13+14'
Reference to Paris Nord Grandes Lignes	RFR+AWN:008727102'
Paris Nord Grandes Lignes is a child/part of Paris Nord (code 14)	RLS+13+14'
Reference to Paris Nord Banlieue	RFR+AWN:008727103'
As a child/part of Paris Nord (code 14)	RLS+13+14'

6.5.1.3 Definition of cities

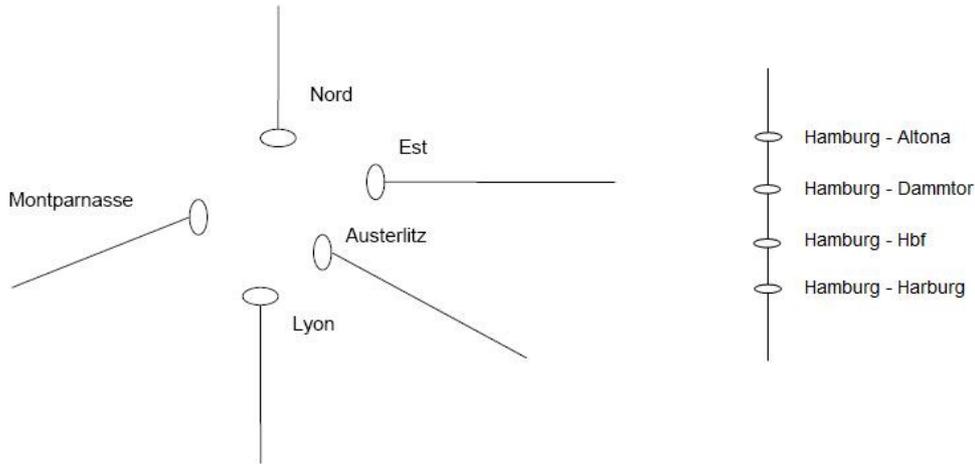
In the timetables context, a 'city' is an abstract set of physical stations. used by electronic travel information systems to build itineraries.

A city cannot be referenced by trains or other services

The user of a timetable information system does not normally know all stations in a city. And the timetable information system will return the available train and the corresponding station.

An example of this function usage is Paris. The important railway stations are located in a circle and are not connected by a direct line. That means that a train stops in one of the stations, only one of them.

The opposite example is the city of Hamburg. In Hamburg all important stations for long distance trains are located on one line. Most of the trains stop at all these stations. Therefore a metastation will not be necessary for Hamburg or, if the responsible RU wants to state that the central and most important station is the station "Hamburg Hbf", then the metastation for Hamburg only contains the station "Hamburg Hbf"



Example Paris:

Example Hamburg

Example Paris:

Facts / situation	EDIFACT
Definition of the city (code 26) Paris	ALS+26+008775000:Paris'
Reference to Paris Nord	RFR+AWN:008727100'
Paris Nord is a child/part (code 14) of the city Paris	RLS+13+14'
Reference to PARIS AUSTERLITZ	RFR+AWN: 008754700 '
PARIS AUSTERLITZ is a child/part (code 14) of the city Paris	RLS+13+14'

6.5.1.4 Station name synonyms

It is possible to give different names to stations and locations.

Facts / situation	EDIFACT
Definition of the station (code 29) KOELN HBF	ALS+29+008015458:KOELN HBF'
Reference to COLOGNE, language French	IFT+AGW::::FR+COLOGNE'
Reference to KEULEN, language Dutch.)	IFT+AGW::::NL+KEULEN'

6.5.1.5 links between stations

Facts / situation	EDIFACT
The time needed to transfer from Connolly to Dublin Ferryport is 60 minutes	MES+60:MIN'
There is a link from Connolly to Dublin Ferryport	RLS+13+6'
The link can be made by bus (code 103)	SER+103'

6.5.1.6 Country Information

If the TSDUPD message contains locations in one country only, the level 1 CNY segment can be used to identify the country where the location is located.

Level 1 - CNY - Country Information

this segment is accepted once per message.

Function To specify country-related information : date and time of summer or winter time transition and related time variation, currency and language(s).

Railway use **At this level**, the segment defines the country **applicable for all locations listed thereafter**.

Example CNY+BE+88:1998-03-28*98:1998-09-27+1*1'

All locations listed hereafter are

- Country BE
- Start summer time (88) 1998-03-28 at 01h00
- Start winter time (98) 1998-09-27 at 01h00

If the TSDUPD message contains locations in more than one country, the level 2 CNY segment is preferred and must be used for each location.

Level 2 - Group 2 - CNY - Country Information

this segment is accepted once per segment ALS

Railway use **At this level**, the segment defines the country **if different from the default country specified in the segment CNY (level 1)**.

ALS+29+008866654:AUBANGE'

CNY+BE+88:1998-03-28*98:1998-09-27+1*1'

6.5.1.7 Time zone information

All arrival and departure times in SKDUPD messages are expressed in local time. For information purposes, it is possible to include time zones and transitions between winter time (standard time) and summer time (daylight saving time) in the message. Due to limitations in the syntax of the message it is only possible to describe one date for transition from winter to summer time and one date for transition from summer to winter time in one message, as can be seen in the example above. This limits the validity of a TSDUPD message to approximately one and a half year.

The usage of the TIZ segment is also limited to one time zone and one time variation, which implies that it can be used only for countries having the same dates for transition between winter and summer time as the United Kingdom (GMT).

The code values of data element 2029 describe the time zone without regard to transitions between winter and summer time.

A clarification of the code list:

Value	Name	Description	Remarks
CET	Central European standard time	Time zone applicable in Central European countries	= UTC + 1 hours during winter = UTC + 2 hours during summer
EET	Eastern European standard time	Time zone applicable in Eastern European countries	= UTC + 2 hours during winter = UTC + 3 hours during summer
GMT	Greenwich mean time	Time zone applicable in countries aligned with the United Kingdom	= UTC during winter = UTC + 1 hour during summer
R2T	Russia zone 2 standard time	Time zone applicable in Russia zone 2 (also Baghdad standard time)	= UTC + 3 hours (Kaliningrad)
R3T	Russia zone 3	Time zone applicable in Russia	= UTC + 4 hours (Moscow)

	standard time	zone 3	
R4T	Russia zone 4 standard time	Time zone applicable in Russia zone 4	Not in use since 2011
R5T	Russia zone 5 standard time	Time zone applicable in Russia zone 5	= UTC + 6 hours
R6T	Russia zone 6 standard time	Time zone applicable in Russia zone 6	= UTC + 7 hours
R7T	Russia zone 7 standard time	Time zone applicable in Russia zone 7	= UTC + 8 hours
R8T	Russia zone 8 standard time	Time zone applicable in Russia zone 8	= UTC + 9 hours
WET	West European time	Time zone applicable in West European countries	Use GMT instead

Since all Russian trains run on Moscow time, time zone identifiers for Russian locations cannot always be used in a standardised way in the train timetable context.

6.5.2 Location data in CRD format

The general solution adopted for the storage of data in the CRD is described in the document “TAP Architecture description”. In the following are only described the specific case of relevance for the timetable application.

Metastations (equivalent of the “cities” defined in 6.5.2.3) should have a primary code in the CRD.

- Each primary location in CRD has an official name in the official language(s) of the country where it is located. A synonym in other languages (allowing the users of a journey planner to use their mother tongue names) can be indicated inserting a second record for each interested station. Example :

Subsidiary type code SY (SYnonym)

```

D E      1 5 4 5 8
D E      1 5 4 5 8      S Y      F R      1 0 8 0      Koeln Hbf
                                           Cologne Centrale

```

- A non-rail link between two stations must be defined to allow journey planners to create a complete journey solution including the transfer between two stations by feet or by public transport. This can be created for any oriented pair of stations inserting a second record for each station. Example :

Subsidiary type code SL (Station Link)

```

F R      1 1 3 0 0
F R      2 7 1 0 0
F R      1 1 3 0 0      S L      F R 2 7 1 0 0      1 1 8 7      Paris-Est
F R      2 7 1 0 0      S L      F R 1 1 3 0 0      1 1 8 7      Paris-Nord
                                           from Paris-Est to Paris-Nord
                                           from Paris-Nord to Paris-Est

```

- A tariff border point is used to indicate where the responsibility of the passenger is passed from one RU to the next one in case of a through ticket. Not necessarily a tariff border point is coincident with a State border point (a tariff border point can be in the middle of the sea, or in a domestic station where two different national RUs have connections). A tariff border point can be indicated inserting a second record for each of the two border stations. Example :

Subsidiary type code TB (Tariff Border)

D E	2 0 1 7 8					Kiefersfelden
D E	2 0 1 7 8	T B	4 6 3		U I C ?	Kufstein
A T	0 2 1 8 4					Kufstein
A T	0 2 1 8 4	T B	4 6 3		U I C ?	Kufstein

Though the above CRD solutions could represent the passenger data, for a technically more correct management of all passenger data it is foreseen to store them in a proper database structure, either extending the structure of the CRD database, or using a dedicated one only linking to the CRD for a coherent use of the location codes. These solutions will be evaluated by the Governance Entity.

7 Process

7.1 How to make data available

The TAP sets an obligation on all RUs to make available the timetable data in the format according to TD B.4. For simplicity of editing, in this chapter the term “deliver” will be used in the sense of “make available”, and “delivery of a resource” will indicate the operation of making a resource available. The term “deliver” does not imply any obligation of “sending” data to single users or central repositories.

7.1.1 Common rules

The following rules apply to the delivery of all types of data (not only of timetables data, but also of tariff and other).

Each RU delivers its own data on an FTP server, managed by the RU itself or by a third party delegated by the RU.

All information about deliveries are stored in a central registry, that will be procured by the Governance Entity. The RU indicates, by means of an entry in the central registry, the type of resource, the address of the server where the resource is available and the method by which the resource can be accessed.

A detailed description of the registry and its functions is available in the TAP Retail Architecture Description

The access control is done at the level of the server, where it is the responsibility of the RU to set filters to allow consumers to download only the resources to which they are authorised. The central registry does not store information about who is allowed to access what.

Each RU must inform the registry every time there is a new delivery (new data or modification or cancellation of existing data).

For each type of resource the Governance Entity will make available a Data Quality Management tool (DQM), capable of performing checks on the data of a single RU, such as:

- Correct formatting of the data
- Use only of codes present in the ERA Directory of code lists
- Use only of location codes present in the locations database
- Logical checks specific to each type of data
- Cross checks between elements contained in different files of a same or more delivery(ies)
- Correct use of the file naming conventions.

It is strongly recommended, though not mandatory by law, that each RU submits every new release of its resources to the DQM tool and performs the corrections or further checks suggested by the tool, before delivering resources on the server and informing the registry.

The following rules focus on the aspect that the data must present at the interface of the server. How the data are managed internally to every RU (prepared in static way, extracted dynamically from a database, etc.) is the choice of each RU.

7.1.2 Specific rules for the timetable data

The timetable data can be modified at any time. A major change happens normally in December (official timetable change date), and the TAP requires that the new data valid from December are delivered at least two months in advance. Changes taking place during the year must be delivered at least 7 days in advance.

Since in the timetable data it is possible to define initial and final validity date of all services, there is no need of having two coexisting files in proximity of a change, with different time validity. It is possible to have at any time only one release of timetable on the server of each RU, by use of the “rolling window” technique (each delivery containing the timetable valid from the date of delivery to as long as the RU is able to plan in advance).

In the same way, though the access to timetable data may be subject to conditions (authorised use, payment), there does not seem to be reasons to differentiate the delivery per different user, therefore it is possible at any time to have available on the server of an RU only one version of its current timetable data (composed of the two files - also called messages - SKDUPD and TSDUPD). Some past versions are also present, as detailed later. This implies that each new delivery contains complete timetables, not only deltas.

Since every timetable delivery present on the FTP server of an RU must consist of the two files SKDUPD and TSDUPD, and there are cross references between the two files, the modification of one of them could affect the other, thus before making available a new release the RU must make sure that the whole set is complete and correct. The two timetable files must be kept always aligned, and therefore submitted to the DQM tool and delivered on the server in the form of a single compressed file. The name of the compressed file can be attributed at will; a suggested naming convention, allowing to understand visually the content of the file, is the following:

`<msg-name>_cccc_YYYYMMnnn_x`

where:

`<msg-name>` is SKDUPD or TSDUPD

cccc is the company code of the RU delivering the data

YYYYMM are the year and month when the data are delivered

nnn is the sequential release number of the delivery in month MM of year YYYY

x counts the files of the same type made available in one delivery (more than one SKDUPD or TSDUPD file can exist in one delivery, the reason being that a maximum of

99999 PRD segments are possible in a single SKDUPD file and a maximum of 99999 ALS segments in a single TSDUPD file).

When an RU has generated its new timetable files, it must compress them in a zip file and possibly submit it to the DQM tool.

Once the new release has been checked with success, the RU moves the previous release of its overall timetable from the main download area to the Archive area of the FTP server, and loads the new release in the main download area. Old releases must be kept in the Archive area by law for at least 12 months after the date they have expired.

The RU then informs the central registry that there have been changes in its timetables data (providing the date of delivery, the name of the new/modified file and the version of TD B.4 to which the data conform).

The Registry notifies the resource consumers who have subscribed to be informed of the changes on timetable data of the RU; they can so access the FTP server of the concerned RU and fetch, if authorised, the new version of timetable data. It is up to the users to decide if they prefer to entirely replace the previous version of data they were using with the new, or select what has been changed in the new version vs the previous one and only apply the delta changes.

7.2 How to integrate data from multiple RUs

In the case of a train operated by multiple carriers, a user wanting to create the complete schedule of a train must make use of the “Connecting to” option present in the timetable of one carrier, as described in 9.2.4, and find in the timetable of the referenced successive carrier the following section of the train.

8 Current situation

Currently most incumbent European RUs publish their timetable data in B.4 format, in principle 2 months before the yearly timetable change date (sometimes this happens only for part of the trains, the rest being made available with some delay).

The data are uploaded in a database called Merits, developed under the supervision of the UIC. The tool allowing to upload the data to Merits performs a set of quality checks on the data.

Part of the Merits users upload their timetable data once per month, others once per week. All UIC members are allowed to download from Merits the timetable data of the others.

9 Data quality

9.1 Security rules

The timetable data do not present any special confidentiality issue, and do not require special security rules.

The RU making them available on its own or someone else's server must only adopt the standard precautions in order to:

- control that only authorised users can access the data, each of them possibly only to the section of data to which he/she is granted access;
- control that authorised users can only perform the allowed operations (normally download of data), and nobody unauthorised can modify or cancel the data.

9.2 Quality checks

The quality of data must be considered under different viewpoints:

9.2.1 Formal and logical checks

The Governance Entity will make available a standard tool (either a standalone package to be distributed to the RUs, or a central service accessible on line), that will perform all reasonable checks on the timetable data of a single RU, such as:

- Correct use of the file naming conventions
- Correct use of the EDIFACT syntax
- Use only of codes present in the ERA Directory of code lists
- Use only of location codes present in the locations database
- Logical checks as detailed in Appendix D.

The RU should make available its own timetable data only after having passed the checks of the tool.

9.2.2 Completeness and correctness

If an RU does not include at all a train in its timetable delivery, or includes a train with wrong parameters but not as wrong as to be detected by the logical checks (e.g. arrival time in a station just few minutes earlier or later than the correct time), these are errors that cannot be detected in advance.

Only if a user of the data or the NEB detects the error, by comparison with correct data found elsewhere (e.g. on a journey planner provided by the RU on its official website, or on the official timetable posters displayed in stations), the RU can be obliged to amend the data and possibly sanctioned for non compliance with TAP

9.2.3 Organisational failures

If an RU :

- does not make available its timetable within the deadlines set up in the TAP, without a valid justification (transport services over which the RU does not have sole control, or change that was not known to the RU seven or more days in advance of it taking effect), or
- does not keep available the previous timetable version at least for 12 months after such data have expired

the NEB detects the error and possibly sanctions the RU for non compliance with TAP

9.2.4 Integration errors between timetables

In the case of a train operated by more than one carrier, the data quality requires not only that each carrier makes available its own data without errors, but also that those data can be correctly integrated in one single train for use in journey planners.

The method to integrate data if the timetables are made available separately by all carriers is described in chapter 7.2.

Nevertheless it is strongly recommended to adopt instead the principle of the “information provider”, i.e. only one of the carriers provides the data of the complete train. To this scope it is also strongly recommended that the agreements on which carrier will be information provider be taken already in the phase of the FTE, when the agreements to cooperate an international train are made.

The Governance Entity will maintain a table showing which is the information provider for all those trains that will be managed under this regime.

If a train operated by more than one carrier is not managed under the regime of information provider, each participating carrier must only include in its timetable delivery the part of the journey for which it is the carrier.

Each participating carrier, apart from the last one, must make use of the “Connecting to” option described in 6.3.2.3, to indicate how the train continues to run under the following carrier.

9.2.5 Integration errors between timetables and tariffs

In order to allow authorised users to match the timetable data and the tariff data of one or more RUs, to provide correct and complete information to the customers, it is essential that timetable data are delivered complete of all elements that are needed for the matching.

The most basic need is the correct inclusion of all the stops of the service. When a service is offered for international or foreign sale it is important to indicate the pricing system, as indicated in 6.3.3.4. If the service is to be sold at NRT or Special Offer fares, all stations used in the route description and all border points must be included in the schedule of the service, even if they are not stops of the train.

10 Governance aspects

10.1 Organisational steps for RUs to get started

1. An RU that has not been producing until now its timetable data in B.4 format, once it has its Company code according to TD B.8 (see TAP Implementation Guides Overview on how to get a Company code), will need first to contact the Governance Entity who will offer its services, according to a Chart Agreement to be signed between the two.
2. The Governance Entity will then make available to the new RU services such as:
 - The Regulation, Technical Documents and Implementation guides
 - Reference data (country codes, company codes, location codes, different code lists)
 - Data quality Management
 - Registry (locations of resources, notifications of changes,..)
 - Etc.
3. The RU will define the address of an FTP server where to make available its timetable data, and will define the access rules (terms and conditions of use of the data, conditions for downloading)
4. The RU will inform accordingly the Governance Entity
5. The RU will organise the access filters to the server where its data are made available, so that only authorised users can download the (part of) data they are allowed to
6. The RU will sign agreements with such authorised users to make official what was negotiated (login/Password for FTP servers and addresses, conditions of use)

10.2 Organisational steps for Third Parties to get started

1. A Third Party (TP) such as a Ticket Vendor or an Authorised Public Body can be authorised to download the timetable data of one or more RUs. In order to identify the TP in a unique and standard way, it must contact the Governance Entity, who attributes to the TP a registration code (if not yet attributed) and offers its services, according to a Chart Agreement to be signed between the two
2. The Governance Entity will make available to the TP services such as:
 - The Regulation, Technical Documents and Implementation guides
 - Reference data (country codes, company codes, location codes, different code lists)
 - Data quality Management
 - Registry (locations of resources, notifications of changes,..)
 - Etc.
3. The TP will contact whichever RU it wants to get the timetable data from, and sign an agreement to make official what was negotiated (data that can be downloaded, login/Password for FTP servers and addresses, terms and conditions of use of the data, conditions for downloading)

4. The TP will organise its internal procedures so that the downloaded data are used strictly in accordance to the conditions set out in the agreement, and not passed to external actors unless so authorised by the agreement

For all other governance information of general character that can apply to all Implementation Guides, see the “TAP Implementation Guides Overview”.

Appendix A - Glossary

Term	Explanation
Alighting	The act by which a passenger gets out of a train
Attributing system	A reservation system performing the function of receiving reservation requests and sending replies
Boarding	The act by which a passenger gets on a train
Booking	The operation of obtaining the reservation of an accommodation on a train
Border station	A station that coincides with a Tariff border point
Carrier	Means the contractual railway undertaking with whom the passenger has concluded a transport contract or a series of successive railway undertakings which are liable on the basis of such a contract (1)
City	See Metastation
Coach group	Group of one or more coaches that do not run for the whole route of a train. They can be pulled by a single train but only for part of its route, or they can be pulled by one train for part of their route and then be disconnected from that train and coupled to another
Couple (a coach group)	Attach a coach group to a pulling train
CRD	Common Repository Domain listing in machine readable format the rail locations used in the data exchange
CTA	Connection Time Available - interval between scheduled arrival of the first train and scheduled departure of the second
Data user	A stakeholder authorised to download the timetable data of one or more RUs, under usage conditions
Days of operation	A conventional representation used to indicate in which days of a given time period a service is present or not. It consists of a string of as many digits as there are days in the given time period, with value 1 for the days when the service is present and value 0 for the others). When the time period is one week, for patterns repeated equally every week, it is possible to use the alternative representation of the "working week" (see)
Disconnect (a coach group)	Detach a coach group from one pulling train that continues its journey, because the coach group has reached its final destination or because it must be coupled to another train
Distribution channel	Means the method (such as ticket office machine, on-train media, public web services, telesales, mobile ticketing) by which a service (information, ticket sale, ticket refund, response to complaints, etc.) is provided to the passenger by a railway undertaking (1). Complementary info : the service can be provided to the passenger by a railway undertaking directly or through a distributor and/or a travel distribution enabler and/or a retailer
DQM	Data Quality Management
FTE (Forum Train Europe)	A series of meetings (normally two per year) where the European RUs and IMs plan the International trains for the following year
Global price	A modality of establishing the price of a rail ticket where it includes in a single undifferentiated amount the contract of carriage, the reservation and any possible supplement. It is the kind of pricing used for IRTs. (synonym : Market price)
IFOPT	Identification of Fixed Objects in Public Transport IFOPT defines a model and identification principles for the main fixed objects related to public access to Public Transport (e.g. stop points, stop areas, stations, connection links, entrances, etc.)
Information provider	The RU making available the timetable of a whole train
IRT (Integrated Reservation Ticket)	Ticket which is issued as an international or national ticket and in which a compulsory reservation is integrated (2)
Itinerary segment	Section of the route of a train, usually defined in order to describe service elements and facilities that are available for only part of the route. Synonym : travel segment

Joining to	The operation by which two trains, having run separately until now, meet in a station and are there coupled to each other to continue the journey together but keeping each its original train number
Joint carrier	Means a carrier linked by a cooperation agreement to one or more other carriers for the operation of a transport service (1)
MCT	Minimum Connection Time (between two platforms in a station)
Metastation	A grouping of rail locations that must be collectively considered by a journey planner, when the user inserts the name of the meta station (synonym : City)
Multiple variation	A service that is described with more than one POP segment
NEB (National Enforcement Body)	Organisations designated by each member State, according to art. 30 of Regulation 1371/2007, to guarantee its good application. The list of NEBs is on http://ec.europa.eu/transport/passengers/rail/rail_en.htm
NRT (Non-integrated Reservation Ticket)	Ticket which is issued as a national or international coupon without a reservation integrated with it for journeys for which reservations are not required (2)
Operator	The carrier operating a train for (part of) its route
Passenger type	A code, and the corresponding definition, identifying the characteristics of one or more rail passengers (e.g. Adult, Senior, Family group). Valid values are listed in ERA Code list B.4.5261
Product	Means a type of train with determined types of services (e.g. high speed, bicycle storage places, PRM accommodation, couchette and/or sleeping cars, dining cars, take-away facilities, etc.) which are linked to relevant prices and may be linked to specific conditions (1)
Pulling Train	The train to which a coach group is coupled
Registry	A tool made available by the Governance Entity to keep track of all resources made available by resource producers, that the authorised resource consumers can consult to find at which address the resource can be found and by which method it can be accessed
Reservation provider	The railway company, which is responsible for the reservation of a train
Routing station	A station where a train passes by without stopping, that is included in the schedule of that train to help match the timetable data to the tariff data
RU (Railway Undertaking)	Means any public or private undertaking the principal business of which is to provide services for the transport of goods and/or passengers by rail, with a requirement that the undertaking must ensure traction; this also includes undertakings which provide traction only (1)
Schedule	The timetable data related to a specific train, with its origin, transit and destination stations and the corresponding times of departure, arrival and passage
Service brand	A code, and the corresponding definition, identifying a commercial family of trains (e.g. AVE, Thalys, RailJet). Valid values are listed in ERA Code list B.4.7009 (together with Service modes)
Service extra	A code, and the corresponding definition, identifying a service offered by an RU on board of its trains (e.g. lunch, movies). Valid values are listed in ERA Code list B.4.7161
Service facility	A code, and the corresponding definition, identifying an accommodation available on a train (e.g. First-class seats, Second-class sleeper T4) or a utility available in a station (e.g. Metro connection, Bus connection). Valid values are listed in ERA Code list B.4.9039
Service mode	A code, and the corresponding definition, identifying a generic type of train (e.g. Intercity, Regional) or a transport mode different from Train (e.g. Bus, Ship). Valid values are listed in ERA Code list B.4.7009 (together with Service brands)
Service number	The number identifying a given transport service (train or coach group) offered in the timetable of an operator
Service provider	The responsible entity providing any services linked to the transport of passengers". The service provider is responsible for the terms and conditions and for the fares valid on the service and is often identical with the operating carrier
Single variation	A service that is described with only one POP segment
SIRI	Service Interface for Real Time Information SIRI is an XML protocol to allow distributed computers to exchange real-time

	information about public transport services and vehicles. SIRI is based on the Transmodel abstract model for public transport information
Sole carrier	Means a carrier that operates a transport service independently of other carriers (1)
Splitting from	The operation by which two trains, having run until now coupled to each other but with different train numbers, stop in a station and are divided from each other to continue separately their journeys keeping each its original train number
Substation	A substation is a part of a station. For example, part of a station can be dedicated to high speed traffic, another to regional traffic and another to urban traffic
Tariff border point	A conventional location used to indicate where the responsibility of the passenger is passed from one RU to the next one in case of successive carriers
TCV (Tarif Commun Voyageurs)	A commercial agreement by various carriers to allow use of NRT tickets on the trains they operate
Timetable	A structured list of data describing the transport services offered to the public by a transport company (in this case a Railway Undertaking) during a given time period
Time zone	A region on Earth that has a uniform standard time
Transmodel	TRANSMODEL is a reference data model for Public Transport operations developed within several European projects.
Working week	A conventional representation used to indicate in which days of a week a service is present or not, as an alternative to the generic method of the “days of operation” (see). The days from Monday to Sunday are indicated with the digits 1 to 7, and only the digits corresponding to the days when the service is present are listed)

(1) : from the TAP glossary

(2) : from the CIT glossary

Appendix B) - Example of conditions for data provision

- 1) All data, which are included in the dataset provided by any RU must be respected when using the data to calculate itineraries, especially the following are important:
 - Period and days of operation of the train services
 - Arrival and departure times
 - Transfer times at stations:
 - between train categories
 - between different service providers
 - explicitly given between two trains
 - connection excluded between two services, although the time between arrival and departure allows the transfer.
 - Stops with traffic restrictions
 - Facilities (potentially more harmonisation work should be done especially on sleeping coaches etc.)
 - Service brands
 - Reservation details
 - Official station names etc.
- 2) The displayed travel advices in the journey planner have to be given complete and in a neutral way. It is not allowed to suppress or favour any RU.
- 3) In order to assure the correct application of the data, the RUs have the right to control the usage of the data. If cases of misuse are identified the right to use can be suspended.

RUs have the right to validate the travel advices before e.g. an information platform starts a service based on the data ("quality gate") and during the service. They do this via a control sample of N customer requests (chosen by the data supplier) per data supplier (origin-destination, time, date, two interchanges at maximum, to be defined mix of long distance and regional trains). If the validation results in less the 90% accordance, RUs have the right to suspend the data delivery.
- 4) The data user must clearly state the intended use of the data.
- 5) If the data user intends to use the data in a public journey planner of any sort, it is obliged to use the full data for any region that it wishes to display i.e. it may not filter out or hide any services that could be of relevance to the customer.
- 6) The data user must always use the latest delivered data set within 48 hours after delivery
- 7) The data user may not modify the content of the data in a way that may render them incorrect
- 8) The licensee may translate data to other formats by respecting all data elements.
- 9) The data user must give a reasonably visible disclaimer on its applications as follows: Train times can change at short notice and it is the responsibility of the passengers to check the travel times and travel routes according to their tickets with the operator

before travel - the RU cannot be held liable for any errors or omissions in the data used to provide the itinerary in the local language.

- 10) The owner of the data (RU) is not liable, if a traveller misses a transport service due to faulty, missing or incorrect information from third parties.
- 11) The copyright and all other intellectual property rights of the provided data will remain the exclusive property of the owners.
- 12) Data may not be passed to other third parties unless with agreement of the owner RU.

Appendix C) - XML messages

C.1 Sample from “Company.xml”

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<Companies xmlns=" http:// era.europa.eu/ ..." (to be defined)
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="replication.xsd">
<Company>
  <Company_Name>Armenian Railway CJSC</Company_Name>
  <Company_UIC_Code>0058</Company_UIC_Code>
  <Country_ISO_Code>AM</Country_ISO_Code>
  <Start_Validity>1999-06-01T00:00:00.000</Start_Validity>
  <Company_Short_Name>ARM</Company_Short_Name>
  <Contact_Details>
    <Contact_Person>Mr V. Badalyan</Contact_Person>
    <Address>50, rue Tigran Metge</Address>
    <City>Yerevan</City>
    <Postal_Code>370005</Postal_Code>
  </Contact_Details>
  <Freight_Flag>true</Freight_Flag>
  <Infrastructure_Flag>true</Infrastructure_Flag>
  <Active_Flag>true</Active_Flag>
</Company>
```

C.2 Sample from “country.xml”

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<Countries xmlns=" http:// era.europa.eu/ ..." (to be defined)
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="replication.xsd">
<Country>
  <Country_ISO_Code>AL</Country_ISO_Code>
  <Country_UIC_Code>41</Country_UIC_Code>
  <Country_Name_EN>Albania</Country_Name_EN>
  <Country_Name_FR>Albanie</Country_Name_FR>
  <Country_Name_DE>Albanien</Country_Name_DE>
  <Sub_Loc_Code_Flag>true</Sub_Loc_Code_Flag>
</Country>
```

C.3 Sample from “primaryLocation.xml”

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<PrimaryLocations xmlns=" http:// era.europa.eu/ ..." (to be defined)
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:noNamespaceSchemaLocation="replication.xsd">
  <Primary_Location>
    <Country_ISO_Code>FI</Country_ISO_Code>
    <Location_Code>00001</Location_Code>
    <Start_Validity>1989-01-01T00:00:00.000</Start_Validity>
    <End_Validity>2016-02-17T00:00:00.000</End_Validity>
    <ResponsibleIM>0010</ResponsibleIM>
    <Location_Name>HELSINKI</Location_Name>
    <Location_Name_ASCII>HELSINKI</Location_Name_ASCII>
    <NUTS_Code>FI123</NUTS_Code>
    <Container_Handling_Flag>true</Container_Handling_Flag>
    <Handover_Point_Flag>true</Handover_Point_Flag>
    <Longitude>-180.000000</Longitude>
    <Latitude>90.000000</Latitude>
    <Free_Text>test description</Free_Text>
    <Active_Flag>true</Active_Flag>
  </Primary_Location>
```

C.4 Sample from “subsidiaryCodes.xml”

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<SubsidiaryTypes xmlns=" http:// era.europa.eu/ ..." (to be defined)
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:noNamespaceSchemaLocation="replication.xsd">
  <SubsidiaryType>
    <Subsidiary_Type_Code>01</Subsidiary_Type_Code>
    <Subsidiary_Type_Name>Track</Subsidiary_Type_Name>
    <IM_Flag>true</IM_Flag>
    <Free_Text>The track is a uniquely defined part of location</Free_Text>
  </SubsidiaryType>
```

C.5 Sample from “subsidiaryLocation.xml”

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<SubsidiaryLocations xmlns=" http:// era.europa.eu/ ..." (to be defined)
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:noNamespaceSchemaLocation="replication.xsd">
  <Subsidiary_Location>
```

```
<Country_ISO_Code>BE</Country_ISO_Code>
<Responsible_IM_Code>0088</Responsible_IM_Code>
<Subsidiary_Location_Code>11019</Subsidiary_Location_Code>
<Location_Code>11023</Location_Code>
<Subsidiary_Type_Code>04</Subsidiary_Type_Code>
<Subsidiary_Location_Name>SCHAERBEEK, AVANT-
PORT/VOORHAVEN</Subsidiary_Location_Name>
<Start_Validity>1989-12-07T00:00:00.000</Start_Validity>
<AllocationCompany>3011</AllocationCompany>
<Active_Flag>true</Active_Flag>
</Subsidiary_Location>
```

D) - Data quality checks

D.1 Blocking errors

(submitted timetable MUST be corrected before notifying it to the Registry)

- A.1) The departure time of a service from a station is earlier than the arrival time in the same station
- A.2) The arrival time of a service in a station is earlier than the departure time from the previous station, taking into account possible time zone difference, date variation or different summer time rules
- A.3) The departure time from the origin station or an intermediate station of a service is missing
- A.4) The arrival time in the destination station or an intermediate station of a service is missing
- A.5) The passing time in a routing station or border point station of a service is missing
- A.6) A service has only one stop
- A.7) A service stops two consecutive times at the same station
- A.8) A frequency is defined for a service, but the difference between first and last time is not a multiple of the frequency value

D.2 Potential errors

(submitted timetable MUST be checked; if potential errors are confirmed to be correct values it can be notified to the Registry)

- B.1) A service is running below the minimum speed between two consecutive stations (a)
- B.2) A service is running above the maximum speed between two consecutive stations (b)
- B.3) A section-related facility or service extra is defined for a service at a single stop
- B.4) A service is defined but never operates
- B.5) A service is waiting at a stop for more than the maximum stop time (c)
- B.6) A service takes more than the maximum leg time between two stops (d)
- B.7) A service stops two non consecutive times at the same station
- B.8) A service is duplicated with another identical service

D.3 Remarks:

- (a) The minimum speed is the minimum average speed normally acceptable at which a service runs between two consecutive stations, defined per service brand.
The speed is calculated as $\text{Distance} / \text{Time}$.
The Distance between locations is calculated from the geo-coordinates of the locations. If the coordinates of one or both locations are not available, the

coordinates of a next or previous location are used. If the system is not able to find one or both coordinates, this validation rule is skipped.

The Time is calculated as difference between the departure time from the first station and the arrival time in the second station.

- (b) The maximum speed is the maximum average speed normally acceptable at which a service runs between two consecutive stations, defined per service brand.
For speed calculation see remark (a)
- (c) the maximum stop time is the maximum duration of a stop of a service in a station normally acceptable, defined per service brand
- (d) the maximum leg time is the maximum duration of the journey of a service between two consecutive stops normally acceptable, defined per service brand

D.4 Suggested actions for the data users

When a user downloads the timetable data of an RU, it is free to (re)submit those data to the DQM tool.

If the DQM shows blocking errors, the user can ask the originating RU for correction of the errors, and in case of no or slow correction can escalate to the Governance Entity or to court.

If the DQM shows potential errors, it has to be assumed that the originating RU has declared those potential errors as correct values.

In this case, according to the type of potential error, the user is suggested to do the following:

- B.1) The low speed is probably due to works on the line. The train can be sold
- B.2) Check reasons with the originating RU before opening the train to sales
- B.3) Sell the train without the facility or service
- B.4) It could be a placeholder for later operation of the train. Do not display in journey planner nor sell
- B.5) Same as B.2
- B.6) Same as B.2
- B.7) It can happen in special cases. The train can be sold
- B.8) Only display in journey planner and sell one of the identical services