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1.0 DRAFT	01.08.2012	All	Import from TAP TSI phase 1 delivery
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1 Table of Contents

2 Introduction

The present document belongs to the set of Technical Documents described in Annex III „List of Technical Documents referenced in this TSI" of the COMMISSION REGULATION (EU) No 454/2011.

3 References

3.1 References

Ref. N°	Document Reference	Last Issue
[1]	Directive 2008/57/EC on the interoperability of the rail system within the Community	
[2]	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	
[3]	TAP TSI: ANNEX B.5 - Electronic Reservation of Seats/Berths and Electronic Production of Travel Documents - Exchange of Messages	Version 1.1
[4]	TAP TSI: ANNEX B.6 - Electronic Seat/Berth Reservation and Electronic Production of Transport Documents - Transport Documents (RCT2 Standard)	Version 1.1
[5]	TAP TSI: ANNEX B.7 - International Rail Ticket for Home Printing)	Version 1.1.1
[6]	Directory of Passenger Code Lists for the ERA Technical Documents used in TAP TSI	Version 1.1.1
[7]	TAP IT Specifications Overview	Version 1.0
[8]	TAP Retail Architecture Description	Version 1.0
[9]	TAP Governance	Version 1.0
[10]	IT specification for the Communication between Railway Undertakings and Infrastructure Managers	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.

4 Particular description of the subject

This IT specification is dedicated for the implementation of the TAP TSI technical document B.7 for indirect fulfilment. The IT-specification describe additional information's and procedures how to implement the requirements of the technical document B.7.

5 Updating

The document has to be updated according to the TAP TSI change control management process, described in chapter 7.5 of Commission Regulation (EU) No 454/2011 of 5 May 2011 [2].

6 Purpose

Commission Regulation (EU) No 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 production of travel documents, 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 possible 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 actors of the fulfilment process can participate, from a technical and organizational 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.

7 Rights & obligations, actors

A travel document is a document allowing its bearer to benefit of one or more transport services. As indicated in the TAP glossary, the process which delivers the Product to the customer after its purchase is called fulfilment.

The terms “direct and indirect fulfilment” are not explained in the TAP glossary, their distinction is made *de facto* by presenting in 4.2.11 one single method of direct fulfilment and three possible methods of indirect fulfilment. Two of the latter being open points, for lack of existing European standards, only “CIV compliant A4 ticket via e-mail delivery*”* is currently defined in TAP Technical Documents, in particular B.7.

The present Implementation Guide deals therefore with the travel documents for home printing, i.e. those printed on common blank paper, devoid of those characteristics by which the paper itself gives a reasonable guarantee on the authenticity of the travel document itself (security background, microfibers, etc.). Therefore travel documents for home printing must rely on different elements to ensure authenticity, as described in B.7 and in this Implementation Guide.

A common categorisation used by the rail industry makes a distinction between:

- Security in media (the authenticity of the ticket is guaranteed by the support itself e.g. paper, plastic card, etc.)
- Security in data (the authenticity is guaranteed by extra data present on the ticket, generated from different elements on the ticket. The controlling staff can interpret this extra data locally visually or with the help of a device, without need of a remote system.
- Security in system (the authenticity is guaranteed by data present in a remote system - possibly copied on a local device -, that the controlling staff can access by means of a reference present on the ticket).

The delivery of travel documents using direct fulfilment is the object of a separate Implementation Guide.

The TAP does not state anything about who can or must generate travel documents for home printing. The only obligation is that:

“*If the railway undertaking makes sales using indirect fulfilment on one of the following methods, it must use the following standards:*

- *CIV compliant electronic delivery (Ticket On Departure),*
- *CIV compliant Manifest On List,*
- *CIV compliant A4 ticket via e-mail delivery.*

....

The above process and the information used for it shall be compliant with the following technical document(s):

- *B.6 (see Annex III),*
- *B.7 (see Annex III),*

- *Standard for European 'Ticket On Departure' and for European 'Manifest On List' is under development. It is therefore an open point and is listed in Annex II*."

Though the text does not state clearly which standard applies to which fulfilment method, the following is applicable:

- B.6 and B.7 apply to the A4 ticket via e-mail delivery (home printing)
- B.6 and the Standard for European 'Ticket On Departure' under development apply to the Ticket On Departure
- The Standard for European 'Manifest On List' under development applies to the Manifest On List.

While for the tickets produced by direct fulfilment the TAP sets an obligation for the RUs to accept tickets compliant to TD B.6, under certain conditions, for access to the trains they operate, a similar obligation is not set for the home printed tickets. The use of the home printing method is therefore completely subject to the existence of a commercial agreement between the distributor and the TCOs, as described further.

In addition Basic parameter 4.2.11 states, both for direct and indirect fulfilment, that "The provisions of this basic parameter shall be applied at least in respect of the tariffs for international and foreign sales". Therefore the present Implementation Guide does not concern travel documents for home printing generated for domestic sales (those will be the subject of one of the Open Points listed in Annex II of TAP Regulation).

The actors of the process of home printing indirect fulfilment are:

- One or more RUs providing the transport services to which the travel document gives right (the carrier(s))
- A customer who buys the travel document
- One or more passengers who will use the transport services (can include or not the client)
- A distributor, operating an interface where the client buys the tickets and from where he/she receives, via download or via e-mail, the document to be printed (can be (one of) the carrier(s))
- An issuer, authorised to sell the ticket on basis of a commercial agreement with all carriers involved in the transport services to which the ticket gives right (can be one of the carriers or a different RU and/or the distributor)
- The TCO (Ticket Controlling Organisation), performing the check of the tickets on board the train or at platform gates (can be the carrier operating the train or a third party delegated by the carrier. In the latter case it has to be another RU or at least have a company code according to Technical Document B.8).

In B.7 these actors are also represented in form of classes, being part of class diagrams and sequence diagrams according to the object oriented computer programming.

8 Travel documents

Though different methods to produce tickets for home printing are defined in B.7, as described in more detail in next chapter, the final layout of the printing is always in accordance with a standard format, described in chapter 3 of B.7.

8.1 Remarks on the home printed ticket layout

The following indications only complement the already detailed explanations provided in chapter 3 of B.7, without repeating what is already there. Therefore for a good understanding of what follows it is necessary to already have a sufficient knowledge of B.7. The following indications include clarifications where the text of B.7 could be interpreted in various ways (indicated by 💡), or detailed IT specifications where the text of B.7 is not detailed enough to guarantee a full interoperability (indicated by ☞).

☞ The issuer's name and/or logo must be printed in the top left corner of the RCT2 zone, according to the specifications of Technical Document B.6

💡 3.1 4th sentence: the reference to formats of Technical Document B.6 has to be understood to be to the classic standard, not the compressed one (see section 1.2.1 of B.6)

☞ 3.1 9th sentence: the second language is not optional. For real usability it is necessary that the name of the type of transport document is always written in a second language between English, French or German, unless one of these is already the language of the sales interface

☞ 3.2: in the list of zones, the FREE ZONE shall be used to print at least the main legal conditions applying to the contract of carriage (e.g. CIV rules, reference to the Regulation (EC) No 1371/2007 "Passenger Rights Regulation")

💡 3.2.1: the text mentions a "reference number" that the distributor can give to the ticket, and a "coupon number" (used for back-office purposes) The reference number will be a number, created in the local system of the distributor. Since every distributor will have its own numbering system, it will be free to chose the number's length/structure. (This number anyway is not to be exchanged with other parties, it is just printed on the ticket)

☞ 3.2.3: in "Description of the elements" not all elements are printed in the language of the distributor. The texts in row 1 and 2 must be written in the language(s) defined in 3.1 9th sentence, the station names must be written in the language of the country in which the station is located, according to the specifications of Technical Document B.6, section 2.1.2

☞ 3.2.4: apart from what is said in the text "At the top of every certificate, there is the carrier code and a symbol, indicating if this certificate is for the outward leg, the return leg of the journey or for a round trip", at the top of the certificate there must be also the names of origin and destination stations of the leg (see also chapter 4.5 of B.7)

- 3.2.4: the use of the arrows is intended to give an immediate evidence of the journey's direction to the TCO, though the same info can obtained reading the names of the stations
- 3.2.4: for a better understanding of this section, it must be clarified that:
  - with the DST mechanism, there is one (and only one, valid for all TCOs accepting the DST mechanism) 2D barcode ("the big 2D barcode" according to Aztec-standard), of size 50 x 50 mm, always in the bottom right corner
  - with the CMC or CKC mechanisms, one or more certificates can be printed in stack on the right side of the sheet, starting from the very bottom if the big 2D barcode is not present, or on top of it if it is there (DST can coexist with CMC or CKC). The certificates used for CMC or CKC can be alphanumeric, 1D barcode or "small" 2D barcode, see also further section 4.5 of B.7
- 3.2.5: a page number is foreseen since more than 1 page could exist if many TCOs are involved in a journey, so that the area in which the conditions are printed ("free zone") or the certificates zone (for CMC & CKC certificates) is to be printed on 2 pages]

8.2 General remarks

Though the real security is provided by the certificates, in order to prevent any attempt of forgery by the client it is recommended that the distributor prepares the ticket as a non modifiable printable file (e.g. PDF file).

It is also recommended, to avoid problems when the ticket is checked on board or at gates, that the distributor provides on the sales interface the following instructions to the client before he/she buys the ticket:

- The ticket must be printed on blank white paper (but it is allowed to use a paper sheet already used on the verso)
- The device (e.g. printer) must have a definition of at least xxx dots/inch
- For the printing the client may need a program able to open the ticket file (e.g. PDF Reader compatible with PDF version xxx). The distributor's interface can provide a link for the free download if the client does not have it already on PC
- After printed the ticket must be kept carefully, avoiding wrinkles and stains

9 Process

It is important to stress that B.7 only describes a way of creating an A4 image of the ticket that the passenger can use to pass the checks of the TCOs. The phases of sale, payment and settlement remain the same as it would be done if the client were present in person at a rail counter or a travel agency.

9.1 Organisational steps for a distributor to sell tickets for home printing

The organisational steps for a distributor who wants to start selling tickets for home printing for international or foreign sales, and for an RU that wants its tickets sold by a distributor as home printing, are described in chapter 10.

9.2 How a distributor generates a ticket for home printing

The Technical Document B.7 defines three different mechanisms for issuing a ticket for home printing:

- Carrier Makes Certificate (CMC)
- Carrier Keeps Certificate (CKC)
- Digitally Signed Ticket (DST)

9.2.1 General remarks

A synthetic description of all three is given in chapter 4 of B.7. Apart from more detailed comments exposed below, it must be noted that:

- CMC and CKC require an interaction between the distributor and the TCO(s) in order for the distributor to be able to generate the ticket, while with DST the distributor generates the ticket by itself, and the TCO(s) only detect the existence of a specific ticket at the moment of the check
- With reference to the categorisation in Chapter 5 of this Guide, CMC and DST can be considered as belonging to the category of “Security in data”, and CKC to “Security in system”
- The mechanism to be used depends on the agreement of the distributor with each TCO
- On the same home printed ticket more than one mechanism can coexist, if different TCO(s) so have agreed with the distributor
- The TAP regulation and the Technical Document B.7 only define how the ticket for home printing can be generated, according to one of the three above described mechanisms. It does not give any indication on how to perform after sales (exchanges, refunds). Therefore it is recommended to use home printed tickets only for non exchangeable and non refundable types of tickets, unless secure methods are agreed bilaterally between distributor and TCO(s)/carriers (e.g. there is in place a procedure by which the data of the tickets are captured by the reading devices of the TCO(s) and

sent back to the central system, and the refund or exchange is performed not earlier than those data have been processed in the central system)

- The TAP regulation does not define either which use can/must be made of info read by the TCO(s) when checking the tickets (back-office checks, statistical analysis, etc.). It is up to each TCO to decide if it only reads the ticket data to check that the passenger is travelling with a valid ticket, or if it wants to store additionally the read data in a portable device and use them later for any back-office procedure.
- The term “certificate” deserves an explanation to avoid confusion. In the meaning of B.7 a certificate is an identifier, referred to a specific ticket and generated by the TCO when the distributor sends a certificate request message (CMC and CKC) or by the distributor itself (DST). Those certificates have nothing to do with a certificate in the sense of the SSL method used to securitize web exchanges.
- There could be therefore no interest in storing those certificates in any kind of registry, while it is important to have a location where to retrieve the public keys of the distributors, for the use of DST. The TAP retail Architecture includes a registry procured by the Governance Entity storing those public keys
- In case of DST, a TCO must have stored on its portable device the public keys of all distributors which could have sold tickets for the train it is checking. Moreover, for each distributor the TCO must store the current public key plus all the previous ones, for as long before as the maximum ticket pre-sale (e.g. if an IRT can be sold 3 months before departure, and the keys are modified every month, 3 keys must be in the device)
- In case of CMC and CKC the security resides in the logic by which the TCO generates the certificate string, its content is either written openly on the ticket, or encoded for machine reading but anyway without cryptography
- The use of DST for NRT implies the risk that a distributor could sell as many as it likes without reporting them for the accounting, without even the risk of the fraud to be discovered by checks on the stock control

9.2.2 Specific remarks

The following indications only complement the already detailed explanations provided in chapters 4 to 10 of B.7, without repeating what is already there. Therefore for a good understanding of what follows it is necessary to already have a sufficient knowledge of B.7. The following indications include clarifications where the text of B.7 could be interpreted in various ways (indicated by ), or detailed IT specifications where the text of B.7 is not detailed enough to guarantee a full interoperability (indicated by ).

- 4.5 1st sentence: the different kinds of certificates are coded in code list B.7.2, and in that list there are actually 4 kinds, but the kind “chipcard” is not considered in B.7. As regards the others, B.7.2 specifies at the moment that as one-dimensional barcode the method to be used is 3OF9 (ISO/IEC 16388:2007). The 2D barcode is indicated as AZTEC XYZ, meaning that it must be of the Aztec type (ISO/IEC 24778:2008), with XYZ pixels for each side of the square pattern. XYZ must be defined in the bilateral agreement between distributor and TCO. Different types of coding can of course be added in B.7.2 following the technology changes

- 4.5 2nd sentence: the bottom right corner of the ticket is reserved for the Aztec code of the DST method, if this method is present (i.e. it was chosen by at least one of the TCOs involved in the journey). The Aztec codes used to encode the certificates in CMC or CKC, in case this type of presentation was chosen by a TCO, are added in the stack of certificates and accompanied by the same elements of the other certificates (arrow, TCO code, ...)
- 4.5 3rd sentence: in the case of the 1D barcode the certificate more precisely is printed on three lines, two of text and the bars in between
- 5.1 2nd sentence: the types of information are actually 3:
  - General information, described in 5.2.2
  - References of the passenger(s), described in 5.2.3
  - References of the journey, described in 5.2.4 and 5.2.5.
- 5.2.1 example: it is to be noted that the elements O and R must be repeated for each passenger because, though they must all travel on the same train, they could have different personal characteristics (e.g. reduction cards, age qualifying for youth or senior tariff, etc.)
- 5.2.3 field 3: it is to be noted that it is required to include the reduction applied to a passenger among the data transmitted in the certificate request, in order to allow the TCO on board the train to check if the passenger actually has the document proving the right to the reduced fare
- ☞ 5.2.4 fields 2a to 3b: these boarding and destination stations are the ones of the complete journey of the passenger. It is up to the TCO to specify, in the answer, which are the initial and final stations of its area of ticket checking
- 5.2.4 field 7: the date in this field is the first date of validity of the ticket
- ☞ 5.4 field 8: the TCO code in this field is the code of the TCO that performs the ticket checks between the stations defined in fields 6 and 7. In the case described in section 5.5 (“multiple TCOs”), the code in field 8 can be the one of TCO2, while the code in field 3 (first 4 characters) is the one of TCO1
- ☞ 5.4 fields 9 and 10: it is to be noted that the content of field 9 must copy exactly the content of field 6 in the certificate request and the content of field 10 must copy field 7
- 5.4 field 12: the note in the “Comments” column has to be understood as follows “Though the field has a maximum size of 200 characters, the actual maximum size must be defined in the bilateral agreement between distributor and TCO, and depends on the number of characters that can be printed in one line if the textual presentation was chosen, or the number of bar coded characters that can be printed in one line if the 1D barcode presentation was chosen, or the size of the Aztec barcode if this presentation was chosen”
- 5.5 it is to be noted that on certain trains and certain routes it is possible to have indifferently one or another TCO, and at the moment of sale of the ticket it is impossible to know which one will be on duty on the specific train, therefore more than one certificate can cover the same O/D, or two certificates can have overlapping O/Ds
- ☞ 5.6 field 4: the content of this field is a copy of the content of field 2 in table 5.4

- 5.6 field 5: the content of this field is a copy of the content of field 3 in table 5.4
- 8.1.1 1st sentence: it is to be noted that the reference to symmetric key-pairs is only made to explain that this encryption method would generate a smaller certificate than the encryption with asymmetric keys. The method with symmetric keys is never used in the context of B.7
- 8.1.3: the actions in bullets 2 and 3 (decompressing ..., checking ...) can be performed in any order or also in parallel.
- 8.3 field 6: "Edition time" must be understood as the moment when the distributor generates the 2D barcode
- 8.3 field 6: Since the distributor could be an on-line travel agent based everywhere in the world, the time must be expressed in Coordinated Universal Time (UTC)
- 8.3 field 7: for a better understanding of this field, it must be considered that its content is a 1-digit number between 0 and 7, obtained as the sum of three numbers as follows:
  - A number that can be 0 if the ticket is domestic and 1 if it is international or for foreign sale
  - A number that can be 0 if the request for the ticket was introduced in the sales system by the customer itself and 2 if it was introduced by a professional agent (salesperson of an RU or third party ticket vendor)
  - A number that can be 0 if the ticket is a valid ticket and 4 if it is a ticket for test.

Therefore the following cases are possible:

0	Domestic ticket, Requested by the customer, Valid ticket
1	International ticket or for foreign sale, Requested by the customer, Valid ticket
2	Domestic ticket, Requested by an agent, Valid ticket
3	International ticket or for foreign sale Requested by an agent, Valid ticket
4	Domestic ticket, Requested by the customer, Test ticket
5	International ticket or for foreign sale, Requested by the customer, Test ticket
6	Domestic ticket, Requested by an agent, Test ticket
7	International ticket or for foreign sale, Requested by an agent, Test ticket

- 8.3 fields 8 and 9: the first language for the edition of the tickets can be defined in the bilateral agreement between distributor and TCO(s), but could also be chosen by the customer if the distributor offers multiple choices, therefore it is useful to have it defined in the record.
- 8.3 fields 8 and 9: the second language is not optional. For real usability it is necessary that the name of the contract of carriage is always written in a second language between English, French or German, unless one of these is already the first language

- 8.4 5th sentence: the text “line 5 (E)” refers to the designation with letters of the rows of an RCT2 ticket. See also following note on fields 6 and 7 of the table
- 8.6 field 7: the DEFLATE compressing method is explained in http://tools.ietf.org/html/rfc1951
- 8.7 1st sentence: the text “When the DST is edited as a 2D barcode” refers to the fact that it could in future be stored on a chipcard of the customer. When printed on paper the DST certificate is always edited as a big 2D barcode
- 10: the procedure for making home-printed tickets is better described in the detailed flowchart shown in Appendix B. Of course the flowchart describes a typical way of operating, but has not to be considered mandatory, in particular the distributor decides about time and mode of payment by the client.

10 Current situation

No European RUs are currently making use of the CMC or CKC methods.

A few RUs (DB, SBB, ÖBB and SNCB between themselves, and SNCF and RENFE between themselves) have been using a form of DST indirect fulfilment, similar to B.7 but not exactly equal.

11 Data quality

11.1 Quality requirements

The quality of the indirect fulfilment presents three types of requirements:

- Correct ticket format

  The A4 printable file produced by the distributor must respect the format defined in B.7, and in addition its upper part must respect the RCT2 layout defined in B.6, with the limited exceptions described in B.7.

- Correct use of codes

  All elements used in the process, both when included in the B.7 messages and when used to prepare the A4 printable file, must be valid data, both in terms of codes contained in the directory of code lists, and in terms of reference data such as company codes and location codes.

- Correct interaction with other systems

  The exchange of messages with the TCOs must comply with the syntax defined in B.7 and the transmission protocols agreed by the distributor and each TCO.

  The distributor, if using the DST method, must make available its public key in correct and timely manner (mandatory use of the Registry).

11.2 Compliance tests

When a distributor puts in place or renews a system for issuing home printed tickets it is necessary to conduct a complete and careful campaign of compliance tests, before putting it in service.

There is no established and standardised set of compliance tests. The distributor must prepare a test campaign in agreement with all carriers whose tickets it intends to sell as print@home, with all TCOs involved and for all methods (CMC, CKC, DST) it intends to use with each TCO.

The test campaign must include all different normal operations (request of a certificate, cancellation of a certificate) and error cases (negative answer of last TCO in a chain, wrong answer, time out, etc.)

12 Governance aspects

12.1 Organisational steps for a distributor to sell tickets for home printing

1. A distributor who intends to start selling tickets for home printing for international or foreign sales must have of course first of all an agreement with one or more carriers, whose trains the distributor wants to sell. To have such sales agreement the distributor must:

   - either be an RU already sharing with the involved carrier(s) a settlement system or act on behalf of an RU with the above characteristics. In this case the issuer is the RU and not the distributor.
   - or be a ticket vendor sharing with the involved carrier(s) a settlement system

   The agreement with the carrier(s) must explicitly state that the tickets can be sold as home printed, and set all relevant commercial conditions (type of tickets, commission rate, settlement method, etc.). It must also indicated who is the TCO for the trains covered by the agreement, unless there is in place in the TAP TSI retail architecture a registry system where the distributor can retrieve this information. The other carrier(s) can require proof that the ticket issuing system of the distributor has passed compliance tests defined in the agreement.

2. If the distributor is not an RU it has to have a registration code.
3. The distributor must then have an agreement with the TCO(s) as described in B.7, indicating which type of mechanism will be used (CMC, CKC or DST), which data the TCO(s) need in the first two cases to generate the certificates, and all relevant operational details (what to do in case of device failure, of fraud, etc.). The distributor must also own an asymmetric couple of private and public key to encrypt the certificate, and make available to the TCO(s) its public key.
4. If the distributor intends to sell also IRTs or reservations for NRTs, it must have access to the reservation systems of the RUs operating the concerned trains. To this scope the distributor must:

   - either be an RU operating a reservation system connected with the one(s) where the concerned trains are hosted
   - or act as remote terminal of the reservation system of an RU with the above characteristics. In this case the issuer is the RU and not the distributor.

5. The distributor must usually have in place an agreement with one or more circuits of electronic payment, since typically the tickets for home printing are sold on internet.
6. The distributor must contact the Governance Entity, who attributes to the distributor a registration code (if not yet attributed) and offers its services, according to a Chart Agreement to be signed between the two.
7. The Governance Entity makes available to the distributor 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.

8. The distributor must subscribe to the TAP Registry to get notified of any change in the timetables and tariffs of the RUs whose trains it wants to sell

12.2 Organisational steps for an RU that wants its tickets sold by a distributor as home printing

1. A carrier RU that wants to have its tickets for international or foreign sales sold by one or more distributors as home printing must have of course first of all an agreement with the distributors willing to do so. To have such sales agreement the distributor must be an RU or a ticket vendor already sharing with the carrier RU a settlement system or act on behalf of an issuing RU with the above characteristics. In this case the issuer is the issuing RU and not the distributor.

   The agreement with the distributor(s) must explicitly state that the tickets can be sold as home printed, and set all relevant commercial conditions (type of tickets, commission rate, settlement method, etc.). It must also indicate who is the TCO for the trains covered by the agreement, unless there is in place in the TAP TSI retail architecture a registry system where the distributor can retrieve this information. The other carrier(s) can require proof that the ticket issuing system of the distributor has passed compliance tests defined in the agreement.

2. If the distributor is not an RU it has to have a registration code.
3. The distributor must then have an agreement with the TCO(s) as described in B.7, indicating which type of mechanism will be used (CMC, CKC or DST), which data the TCO(s) need in the first two cases to generate the certificates, and all relevant operational details (what to do in case of device failure, of fraud, etc.). The distributor must also own an asymmetric couple of private and public key to encrypt the certificate, and make available to the TCO(s) its public key.
4. If the carrier RU intends to allow the distributors to sell also IRTs or reservations for NRTs for trains hosted in its reservation system, it must give access to such reservation system to the distributors. To this scope the distributor must:
   - either be an RU operating a reservation system connected with the one of the carrier RU
   - or act as remote terminal of the reservation system of an issuing RU with the above characteristics. In this case the issuer is the issuing RU and not the distributor.
5. The distributor must usually have in place an agreement with one or more circuits of electronic payment, since typically the tickets for home printing are sold on internet.
6. The carrier RU is by definition already registered with a company code by the Governance Entity. Each distributor, if not already registered, must contact the Governance Entity, who attributes to the distributor a registration code and offers its services, according to a Chart Agreement to be signed between the two.
7. The Governance Entity makes available to the distributor services such as:

a. The Regulation, Technical Documents and Implementation guides

b. Reference data (country codes, company codes, location codes, different code lists)

c. Data quality Management

d. Registry (locations of resources, notifications of changes,..)

e. Etc.

8. The distributor must subscribe to the TAP Registry to get notified of any change in the timetables and tariffs of the carrier RU

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
1D barcode	One-dimensional barcode, a possible type of certificate for home printed tickets
2D barcode	Two-dimensional barcode, a possible type of certificate for home printed tickets
A4	A paper size of 210 x 297 mm defined by international standard ISO 216
After sales (operations)	The complex of activities that can take place after a ticket has been sold (typically exchange or refund)
Asymmetric keys	Couple of keys used in a cryptographic system, one to lock or encrypt the plaintext, and one to unlock or decrypt the cyphertext. Neither key will do both functions. One of these keys is published or public and the other is kept private.
Attributor	An undertaking managing the system which attributes seats and accommodation and the relevant fares (including IRT). At the same time the attributor may be a carrier, distributor, issuing undertaking and/or sales point
Barcode	An optical machine-readable representation of data, which shows data about the object to which it attaches
Baseline	A stable kernel of interrelated legal and technical documents, in terms of system functionality, performance and other non-functional characteristics
Border point (Tariff -)	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
Business unit	Grouping of railway undertakings which make a joint train service offer (PRR transport service) which may be branded. As a rule they are formed into an economic interest grouping (GIE)
Carrier	Contractual carrier with whom the passenger has concluded the contract of carriage pursuant to the CIV Uniform Rules, or a successive carrier who is liable on the basis of that contract
CCM	Change Control Management - the process by which the TAP TSI Regulation and its related documents can be modified during their life
CER	Community of European Railways and Infrastructure Companies
Certificate	In the meaning of B.7 a certificate is an identifier, referred to a specific ticket and generated by the TCO when the distributor sends a certificate request message (CMC and CKC) or by the distributor itself (DST)
CIT	International Rail Transport Committee [Comité international des transports ferroviaires]
CKC	Carrier Keeps Certificate - one of the possible methods for implementation of home printing according to B.7
Class	In object-oriented programming, a class is a construct that is used as a blueprint to create instances of itself – referred to as class instances, class objects, instance objects or simply objects. A class usually represents a noun, such as a person, place or thing, or something nominalised
Class diagram	In the Unified Modeling Language (UML) a class diagram is a type of static structure diagram that describes the structure of a system by showing the system's classes, their attributes, operations (or methods), and the relationships among the classes
Classic standard	One of the RCT2 layouts defined in TD B.6, alternative to the compressed standard

Closed system	A ticket controlling system with on-line connection on board of a train, giving the possibility to detect if a ticket is used twice
CMC	Carrier Makes Certificate - one of the possible methods for implementation of home printing according to B.7
Commission rate	The remuneration earned by a retailer for the sale of a rail product, expressed in percentage of the product value
Compressed standard	One of the RCT2 layouts defined in TD B.6, alternative to the classic standard
Contractual carrier	In principle, the carrier who concludes the contract of carriage with the passenger and who in principle is the first carrier providing carriage. Substitute carriers are not contractual carriers. The carrier concluding the contract of carriage is described as the “issuing undertaking” in CIT documentation
Customer	Means a person who intends to buy, is buying, or has bought a railway product for him/herself or for other person(s). May therefore be different from passenger (see passenger)
Deliverable (TAP -)	One of the documents that must be produced as result of TAP Phase One
Departure point	Railway station or halt, bus station, bus stop or a port. Departure point may also be a specific region, a specific country or a frontier point
Destination point	Railway station or halt, bus station, bus stop or a port. Destination point may also be a specific region, a specific country or a frontier point
Direct fulfilment	The provision to a customer of a travel document printed on value paper at the same time of the purchase
Distributor	Undertaking providing legal and technical capacity to the issuing undertaking to sell rail tickets or to provide on line-facilities to passengers to buy rail tickets. At the same time the undertaking may be a sales point, attributor, carrier, issuing undertaking and/or ticket control organisation (TCO)
Domestic section	A section which only involves one country
DST	Digitally Signed Ticket - one of the possible methods for implementation of home printing according to B.7
e-ticket	Ticket held as an electronic data record capable of being transformed into legible written symbols. Several data records form a single contract when then they are issued to be a single (through) ticket in accordance with the GTV-CIT
Encryption	The process of transforming information (referred to as plaintext) using an algorithm (called a cipher) to make it unreadable to anyone except those possessing special knowledge, usually referred to as a key. The result of the process is encrypted information (in cryptography, referred to as ciphertext).
Foreign sales	Means the sale of a train ticket by an issuer which is not (one of) the carrier(s) operating the train where the ticket will be used. The issuer is located in a country different from the country of the carrier(s)
Fulfilment	Means the process which delivers the Product to the customer after its purchase
Global fare (global price)	See IRT
Governance Entity	A regulatory entity for the governance of the telematics TSIs (TAP TSI and TAF TSI) This entity will address both RU/IM and passenger retail business. It will procure and provide the services needed by TAP TSI and TAF TSI stakeholders without which RUs and IMs cannot meet their regulatory obligations. The entity will facilitate the work needed in common amongst RUs and IMs
Home printing	A type of indirect fulfilment where the customer buys a rail ticket in remote (on the web, at the telephone, …) and receives by e-mail or by download a printable

	file that will be accepted on board as valid ticket
IG	Implementation Guide
Infrastructure manager	Infrastructure manager as defined in Directive 91/440/EC and the CUI Uniform Rules
Indirect fulfilment	The provision to a customer of a travel document printed on value paper in a moment successive to the purchase, or stored on a medium different from value paper
IRT [Integrated Reservation Ticket]	Ticket which is issued as an international or national ticket and in which a compulsory reservation is integrated. IRT GTV-CIT
International sales	Means the sale of a train ticket for an international journey
IRTHP	International Rail Ticket for Home Printing; ticket which is issued over the internet and printed out on DIN A4 paper by passengers using their own printers. Forms part of the class of e-tickets. IRTHP GTV-CIT
Issuer	Means an undertaking selling the ticket and receiving payment. May be a carrier and/or a distributor. The issuer is the undertaking indicated on the ticket with its code and possibly its logo
IT	Information technology
Leg	One of the sections in case of a journey that requires the use of more than one train
Manifest on List	Means a fulfilment method where the customer makes its purchase in advance (e.g. at home) and receives only a confirmation, usually with a reference code. The undertaking performing this kind of sale provides the TCO with a list of all passengers (and reference codes) admitted on the specific train. The passenger simply manifests his/her desire to be admitted on the train before/after departure at the TCO. TCO checks whether the passenger is allowed to embark/stay on the train
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.
One way journey	A journey from an origin A to a destination B, without return to A
Open point	A component of a TSI where the need of a European standard is acknowledged, but the need cannot be immediately satisfied for lack of existing standards
Open system	A ticket controlling system without on-line connection on board of a train, where there is no possibility to detect if a ticket is used twice
Outward	In a return journey, the first half of the journey
Passenger	Means a person who intends to make, or is making, or has made a journey using the transport services and other services of one or more railway undertakings May be different from customer (see customer)
Phase One (TAP -)	The first phase of TAP TSI implementation, consisting of definition of detailed IT specifications, governance and master plan
Private key	One of the asymmetric keys (see)
PRR	Regulation (EC) No 1371/2007 of the European Parliament and of the Council of 23 October 2007 on rail passengers' rights and obligations. PRR GCC-CIV/PRR
Public key	One of the asymmetric keys (see)
RCT2	RCT2 (Rail Combined Ticket) is the railway standard for the electronic issue of international, and where appropriate national, tickets and reservations on paper.

	It can be used either as ticket only, as reservation only or as combined ticket and reservation, the latter mainly for IRT offers
RCT2 compressed	RCT2 compressed is the railway RCT2 standard for the electronic issue of international, and where appropriate national, tickets and reservations on paper on which barcodes are also printed. The RCT2 compressed standard may only be used in conjunction with 2Dbarcodes
Return	In a return journey, the second half of the journey
Return journey	A journey from an origin A to a destination B, with return to A via the same route
RISC	Rail Interoperability and Safety Committee
Round trip journey	A journey from an origin A to a destination B, with return to A via a route different from the one of the outward journey
RU	Railway Undertaking
Security background	Background printed on paper documents to provide protection against forgeries, copies and alterations
Security certificate	Specially coded feature for IRTHP and e-tickets. The security certificate, in the form of a 2D barcode is an additional security feature
Security feature	Features of different types to protect paper documents from forgeries, copies and alterations
Service fee	Charge which may be made by the issuing undertaking for issuing the ticket. It may be shown on the ticket itself (included in the total or additional to the fare proper) or receipted on a separate document
Security in data	A type of fulfilment where the authenticity of the ticket is guaranteed by extra data present on the ticket, generated from different elements on the ticket. The controlling staff can interpret this extra data locally visually or with the help of a device, without need of a remote system.
Security in media	A type of fulfilment where the authenticity of the ticket is guaranteed by the support itself e.g. paper, plastic card, etc.
Security in system	A type of fulfilment where the authenticity of the ticket is guaranteed by data present in a remote system - possibly copied on a local device - that the controlling staff can access by means of a reference present on the ticket
Sequence diagram	In a Unified Modelling Language (UML) a sequence diagram is a kind of interaction diagram that shows how processes operate with one another and in what order.
SSL	Secure Socket Layer
Station manager	Organisational entity in an EU Member State, which has been made responsible for the management of a railway station
Successive carrier	Carrier in a chain of carriers who perform the contract of carriage with the passenger and who are liable for the performance of that contract. Successive carriers are shown in code on tickets
TAP TSI	Telematic Applications for Passenger services - Technical Specifications of Interoperability
TCO	Ticket Controlling Organisation - Organisation charged with verifying passenger tickets and, if appropriate, making the security certificate for the sale of tickets via the internet (IRTHP) and the security certificate for e-tickets available to the distributors. The TCO may be in the same time a sales point, attributor, carrier, distributor and/or issuing undertaking
TD	Technical Document

Ticketing	The generation of a ticket
TLT	Train Linked Ticket
ToD	Ticket on Departure
Transport document	Document which confirms the contract of carriage for passengers (ticket), for luggage (luggage voucher) or for vehicles (carriage voucher)
Travel agent	A point of sale for railway tickets to passengers accredited by the carrier
Travel document	See transport document
UIC	International Union of Railways [Union international des chemins de fer]
VAT	Value added tax
XML	eXtensible Markup Language (XML) is a markup language that defines a set of rules for encoding documents in a format that is both human-readable and machine-readable. It is defined in the XML 1.0 Specification produced by the W3C, and several other related specifications all gratis open standards
XSD	XML Schema Document—a document written in the XML Schema language, typically containing the "xsd" XML namespace prefix and stored with the ".xsd" filename extension

Appendix B - Flowchart of procedure for making home-printed tickets