Telematics Applications for Passengers and freight
TAP/TAF TSI

European Railway Agency
(ERA)

18/09/2013
railML® conference Paris
N° 1
1. European Railway Agency (ERA)
2. TAP TSI
3. TAF TSI
4. Links to other specifications
5. TAF/TAP TSI and railML®
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>CEN</td>
<td>European Normalization Committee</td>
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<tr>
<td>CI</td>
<td>Common Interface</td>
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<td>EC</td>
<td>European Commission</td>
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<td>ERA</td>
<td>European Railway Agency</td>
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<td>IM</td>
<td>Infrastructure Manager</td>
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<td>LRU</td>
<td>Lead railway undertaking</td>
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<td>PRM</td>
<td>Passengers with Reduced Mobility</td>
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<td>RISC</td>
<td>Railway Interoperability and Safety Committee</td>
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<td>RU</td>
<td>Railway Undertaking</td>
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<td>TAF TSI</td>
<td>Telematics Applications for Freight - Technical Specifications for Interoperability</td>
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<tr>
<td>TAP TSI</td>
<td>Telematics Applications for Passengers – Technical Specifications for Interoperability</td>
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<tr>
<td>TD</td>
<td>Technical Document of the European Railway Agency</td>
</tr>
</tbody>
</table>
The European Railway Agency

- Established in 2004 (EC Regulation 881/2004)
- Located in Valenciennes and Lille
- Staff: 154 (2013)
- ERA is a EU institution:

  European Parliament
  Court of Justice
  Court of Auditors
  European Investment Bank
  European Council (summit)
  Council of Ministers (Council of the EU)
  Economic and Social Committee
  European Commission
  Committee of the Regions
  Agencies
  European Central Bank
Main tasks of ERA:

- address recommendations for European Rail Legislation (with economic evaluation and justification) to the European Commission concerning Safety, ERTMS, Cross-acceptance and Interoperability

- issue opinions to the European Commission (or to National safety authorities) concerning rail National safety rules, Interoperability of the trans-European rail network and Monitoring the work of notified bodies

- maintenance of some public rail related databases
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The TAP TSI is based on the following legal documents:

• Directive 2008/57/EC on the interoperability of trans-European rail system (Annex II)

• European Rail Passengers’ Rights Regulation EC/1371/2007 (Art 10 and Annex II).

The Technical Specification for Interoperability on “Telematics Applications for Passengers” (TAP TSI) prescribes protocols for the data exchange of

- timetables,
- tariffs,
- reservations, fulfillment
- Information to passengers in station and vehicle area
- train running information,
- etc

which must be respected by the European rail sector (railways, infrastructure managers, ticket vendors etc.) according to the European Rail Passengers’ Rights Regulation EC/1371/2007 and to the Interoperability Directive EC/2008/57.
In Dec 2009 ERA has signed contract with UIC according to which UIC has transferred the underpinning UIC leaflets as ERA Technical Document B.1, B.2, B.3, B.4, B.5, B.6, B.7, B.8, B.9 and B.10.

ERA Technical Document B.30 is derived from the TAF TSI (Telematics Applications for Freight) RU/IM train movement messages.

Above ERA Technical Documents (and underpinning ERA TAP Passenger Codelist) are annexes of the TAP TSI, thus, legally binding message interfaces for timetables, tariffs, reservations, fulfilment, and train running information.


The documents are maintained by ERA though a change control management process.
The structure of TAP TSI can be outlined as follows:

- **Commercial communication**
  - Time tabling
  - Tariff/Fare handling
  - PRM assistance handling
  - Bike handling
  - Reservation handling
  - Fulfilment (ticketing)

- **Activity Area**
  - TSI Ch.
    - 4.2.1
    - 4.2.2
    - 4.2.6
    - 4.2.7
    - 4.2.9
    - 4.2.11

- **T.D.**
  - Code lists (example)
    - B.4
    - B.1 - 3
    - B.10
    - B.5
    - B.6 - 7

- **Code lists (example)**
  - B.4.3039 - Name: Party identifier
  - B.2.5 - Tariff Names
  - B.10.6 – On Board Facility
  - B.5.37.1 – Compartment request
  - B.5.35 - Smoking/ non-smoking
  - B.7.2 - Layout of the certificate
No unique data format is used for TAP TSI technical documents. The used data format depends on the technical document:

• EDIFACT (timetabling)
• Fixed length text files (tariff data)
• Binary messages (reservation messages)
• XML-messages (home printed tickets, PRM reservation)
### Further steps of TAP TSI

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The Technical Specification for Interoperability on “Telematics Applications for Freight” (TAF TSI) drafted by ERA prescribes protocols for the data exchange of:

- Path Request
- Train Running Forecast
- Service Disruption Information
- Shipment Estimated Time of Interchange / Arrival
- Etc.

TAF TSI prescribes furthermore databases which must be implemented by European RUs, IMs or Freight Customers:

- Reference Files (such as location ID, company ID etc).
- Rolling Stock Reference Databases
- Wagon and Intermodal Unit Operational Database
- Trip plan for wagon / Intermodal unit
Functionalities:

• **RU/IM:** Long-term planning, Path Request on Short Notice, Train Preparation, Train Running Forecast, Service Disruption Information and Train Location.

• **LRU/Customer:** Consignment note data, exchange of information concerning ETI/ETA calculation, Interchange Reporting and Wagon Movement
Content of TAF TSI – System Architecture

TAF TSI System Architecture:

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TAF TSI prescribes the mandatory use of a so called “common interface” which is mandatory for all RUs and IMs:

- the appropriate formatting, conformity checking, encrypting, signing, addressing and decrypting of the exchanged messages
- the appropriate access to all the data required according the TSI within each RU, IM, Customer, etc., whether the relevant Databases are central or individual
<xml version="1.0" encoding="ISO-8859-1"/>
<!--Sample XML file generated by XMLSpy v2013 (x64) (http://www.altova.com)--> <!--xmlns="http://www.era.europa.eu/schemes/TAFTSI/5.2"-->
<TrainRunningInformationMessage>
  <MessageHeader>
    <MessageReference>
      <MessageType>2002</MessageType>
      <MessageTypeVersion>5.1.9</MessageTypeVersion>
      <MessageIdentifier>dc024a24-1034-49eb-84f2-50bd52d1536c</MessageIdentifier>
      <MessageDateTime>2012-12-21T14:13:36.486+01:00</MessageDateTime>
    </MessageReference>
    <Sender>0014</Sender>
    <Recipient>0080</Recipient>
  </MessageHeader>
  <MessageStatus>1</MessageStatus>
  <OperationalTrainNumberIdentifier>
    <OperationalTrainNumber>4711</OperationalTrainNumber>
  </OperationalTrainNumberIdentifier>
  <TrainLocationReport>
    <Location>
      <LocationPrimaryCode>12345</LocationPrimaryCode>
    </Location>
    <LocationDateTime>2001-12-17T09:30:47Z</LocationDateTime>
    <TrainLocationStatus>12</TrainLocationStatus>
  </TrainLocationReport>
</TrainRunningInformationMessage>
Minimum and Maximum Implementation Dates:
1. European Railway Agency (ERA)
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5. TAF/TAP TSI and railML
Legal background in TAP TSI: chapter 4.2.22 “Management of connection with other modes of transport”

- EN 12896 (‘Transmodel’) and EN TC 278 WI 00278207 (‘IFOPT -Identification of Fixed Objects in Public transport’)
- EN 15531 (‘SIRI’) for the exchange of real-time timetables and norm EN TC 278 WI 00278207 (‘IFOPT’) for the exchange of stop/station’ data

Development of „NeTEx“:

- Standard in development by CEN TC278 WG3 SG7/S9
- XML-schema based on EN 12896 („Transmodel“)
- Define the exchange of timetable-, network- und tariff-data for public transport
- Timetable and network defined as draft (Technical Specification CEN/TS 16614-2)
- In work: tariff data exchange

Relationship with national standards

- National standards (e.g. VDV452, Neptune) and European standards (e.g. TAP TSI) can be expressed in NeTEx
Relationship TAP TSI - NeTEx

TAP TSI timetable data (EDIFACT):

Transmodel/NeTEx:

```
<ScheduledStopPoint id="tap:ScheduledStopPoint:0054547599">
  <Name>OHNIC</Name>
  <Location>
    <Longitude>13.8403333333</Longitude>
    <Latitude>50.5888888889</Latitude>
  </Location>
  <validityConditions>
    <AvailabilityCondition id="tap:AvailabilityCondition:1993-06-01T00:00:00" />
    <ToDateTime>2099-12-31T23:59</ToDateTime>
  </AvailabilityCondition>
  <validityConditions>
    <AvailabilityCondition id="tap:AvailabilityCondition:1993-06-01T00:00:00" />
  </AvailabilityCondition>
  <StoppingPlaceShortName>OHNIC</StoppingPlaceShortName>
  <StopType>railStation</StopType>
  <RequestStop>false</RequestStop>
  <TopographicPlaceView>
    <CountryRef ref="cz"/>
  </TopographicPlaceView>
</ScheduledStopPoint>
```
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TAP TSI timetable data (EDIFACT):  

railML®:
1. Harmonization of XML data elements between telematics applications for freight and passengers and railML®
   • Transformation between the different XML-schemes easier
   • no loss of accuracy because of data conversions
2. Harmonization of concepts
   • E.g. Naming for similar purposes
3. Definition of Mappings
   • Definition of a mapping between the different data models/XML-schemes (e.g. Path request and railML timetable schema)
   • Definition of a mapping railML® - NeTEx
4. Clear definition of borders for the different XML-schemes and data models
   • E.g. TAP TSI is dealing with timetable data for passenger information, TAF TSI is dealing with partially with timetable data for operational purposes
TAF TSI:

TAP TSI:
Questions ?
Thank you for your kind attention:

Stefan Jugelt

Project officer for Telematic Applications European Railway Agency

E-mail: Stefan.Jugelt@era.europa.eu
Backup
Purpose:
- Exchange of timetable data

Conditions:
- Annual timetables must be published at least two months in advance
- Timetable changes must be published at least 7 days in advance

How:
- File in EDIFACT-format (technical document B.4)
Purpose:
- Exchange of tariff data *

Conditions:
- RU’s shall provide their tariff data to other RU’s, third parties according to distribution agreements between them
- Tariffs must be published to authorized public bodies

How:
- Distance based fares based (technical document B.1)
- Ticket + reservation (technical document B.2)
- Reduction cards, supplements and special offers (technical document B.3)

* For international and foreign sales
Purpose:
- Exchange of availability/reservation messages data between RU’s and ticket vendor
- Reservation of seats, berths, storage place for bicycles and cars

Conditions:
- Based on commercial agreements between RU’s and/or ticket vendors

How:
- Reservation of seats, berths and storage places for cars and bicycles (technical document B.5)
- Reservation of PRM assistance (technical document B.10)
- On bilateral agreement usage of proprietary standards possible
Fulfilment

Conditions:
- Based on commercial agreements between issuer (e.g. RU, travel agency) and RU

How:
- RCT2 Ticket format (technical document B.6)
- Home printed ticket (technical document B.7)

Future developments:
- Not all fulfilment methods are currently covered by TAP TSI
- ERA requested a CEN standard for e-ticket and manifest on list
- Delivery of this standard foreseen for 2012
Example:

PRD+00090::37::Vauban+0083**0085'
POP+273:2003-12-15/2003-12-20::111111'
PDT++:::50'
SER+9'

POR+008301700:37:12+*0810'
POR+008507000:37:12+1156*1204'
POR+008721202:37:12+1444*1446'
POR+008200100:37:12+1650'

ODI+008507000*008200100+2*4'
SER+26'

EC 90 provides a restaurant (code 9).

The train runs from MILANO (008301700) via BERN (008507000) and STRASBOURG (008721202) to LUXEMBOURG (008200100).

Bicycle transport (code 26) is available only from BERN (stop index 2) to LUXEMBOURG (stop index 4).
Example:

Series N° 02399 from the Austrian Federal Railways (ÖBB – 1181)

RU | Series N° | Origin | Destination
--- | --- | --- | ---
1181023990300123600 | Feldkirch | 00317600Flugh. Graz-Feld.010000

0 0 0<1181>Zell/See*Trieben*Bruck/Mur
via with carrier code

Km in 2nd class | fare table N°
--- | ---
0000000000000000000000200912100120991231

Validity period
Examples:

B.5:

83859302707811000165900 001101001221904830011185000800522 070000005
(reservation request for 5 places Milano-Brig)

B.10:

<Requestor Company="1180" System="1"/>
<Dialogue DialogId="12345" Date="2010-08-13"/>
<PpmCustomer DisabilityDegree="25" PriorityCard="true" WheelChairChange="true">
<pc:FirstName>Jan</pc:FirstName>
<pc:LastName>Smith</pc:LastName>
<pc:Title>Mr</pc:Title>
<pc:DateOfBirth>1967-08-13</pc:DateOfBirth>
<pc:Phone Preferred="false">+49 5558 458787</pc:Phone>
<pc:MobilePhone Preferred="false">+49 5458</pc:MobilePhone>
<pc:E-mail Preferred="false">JS@blah.com</pc:E-mail>
...
Practical example: B.6

Generic layout of a RCT2 ticket:
Practical example: B.7

Generic layout of a home print ticket (A4 format) - upper and lower part: