Interoperable Barcode Ticketing Code of Practice

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ATOC
Association of Train Operating Companies

National Rail Enquiries   Rail Settlement Plan   Rail Staff Travel

Version History

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Release Control

The following personnel must formally approve the document prior to assigning a non-draft version number.

Organisation	Role	Name
RSF	Approval of Standards	Retail Systems Forum
RSP	Document Owner	James Wright

Distribution

Organisation	Role	Name
RSP TIS Accreditation	N/A	N/A
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Rail Settlement Plan

Interoperable Barcode Ticketing

Code of Practice

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Glossary

Term	Meaning
ASSIST	Accreditation Standards Site Integrating System Toolset – RSP's Accreditation and RSP Compliance Standards Website
ATOC	Association of Train Operating Companies
CCST	Credit Card Sized Ticket
CoP	Code of Practice
eTVD	Electronic Ticket Validation Database
PKR	Public Key Repository
Public Key	Produced as part of asymmetric encryption and needed in order to decode a barcode
RCS	Retail Control Service
RSP	Rail Settlement Plan
TOC	Train Operating Company
TIS	Ticket Issuing System
UTN	Unique eTicket Number

1.   Introduction

1.1   General

1.1.1   This Code of Practice (CoP) sets out the key aspects of the responsibilities and operational requirements for Interoperable Barcode Ticketing to support all parties' compliance with the terms of their licence.

1.1.2   The primary aim of the CoP is to provide governance over the operation of Interoperable Barcode Ticketing business processes in order that:

- The customer's experience is consistent;

- There is uniformity of barcode ticket rendering for each delivery medium across retailers;

- Processes are established for the management and distribution of Public Keys needed to decode a barcode ticket; and

- The, risk of fraud is reduced through adequate exchange of scanning records.

1.1.3   The CoP complements existing processes.

1.2   What this Code of Practice covers

1.2.1   This CoP applies to all parties participating in Interoperable Barcode Ticketing.

1.2.2   A 'Participant' is defined as any party that has responsibility for the retail, fulfilment or validation of an interoperable barcode product.

1.3   What this CoP does not cover

1.3.1   The CoP does not cover non-Interoperable Barcode Ticketing.

1.3.2   The CoP does not replace the ATOC / RSP licences or the licence obligations, business processes, processing Standards, TIS Accreditation requirements or other associated RSP Compliance Standards.

1.3.3   The CoP should be seen as complementary to these formal and mandatory requirements, and obligations.

1.4   Responsibility to Apply the Code of Practice

1.4.1   Compliance with the CoP is self-regulating, although it may be subject to audit on an ad-hoc basis by RSP.

1.4.2   The CoP aims to benefit all parties and also to place obligations on those parties.

1.5   Sponsoring Body

1.5.1   The executive body responsible for the governance of the CoP is the Retail Systems Forum.

1.5.2   Fares and Retail Group, Third Party Agent Scheme Management Group and other groups as appropriate shall be invited to recommend changes to the CoP.

1.6 Maintenance

1.6.1 RSP will maintain the document and is the point of contact for all matters relating to the CoP.

1.7 Document References

RSP Ref	Title	Usage
RSPS2000	RSP Barcodes in Rail Retailing	Defines the set of barcodes which can be utilised for retail in the rail industry.
RSPS3001	Barcode Presentation, Key Management and Data Specification	Defines the data structure and content for barcodes for use in rail products
RSPS3008	Self-Print Ticket Specification	Defines the layout of Self Print ticketing.
RSPS3013	Mobile Telephone Ticketing Layout & Visual Validation Specification	Defines the approved mobile ticket layout to be used by Ticket Issuing Systems (TIS).
RSPS3019	Paper Roll Ticket Specification	Defines the layout and process to be used for issue of Paper Roll Tickets (PRT)
RSPS5043	Electronic Transaction Validation Database Interface Messaging Specification	Defines the required interface messaging format needed to communicate between eTVD's.

2. Architecture

2.1   Figure 1 is an illustration of the systems and interactions that comprise an Interoperable Barcode Ticketing ecosystem for a retailer.

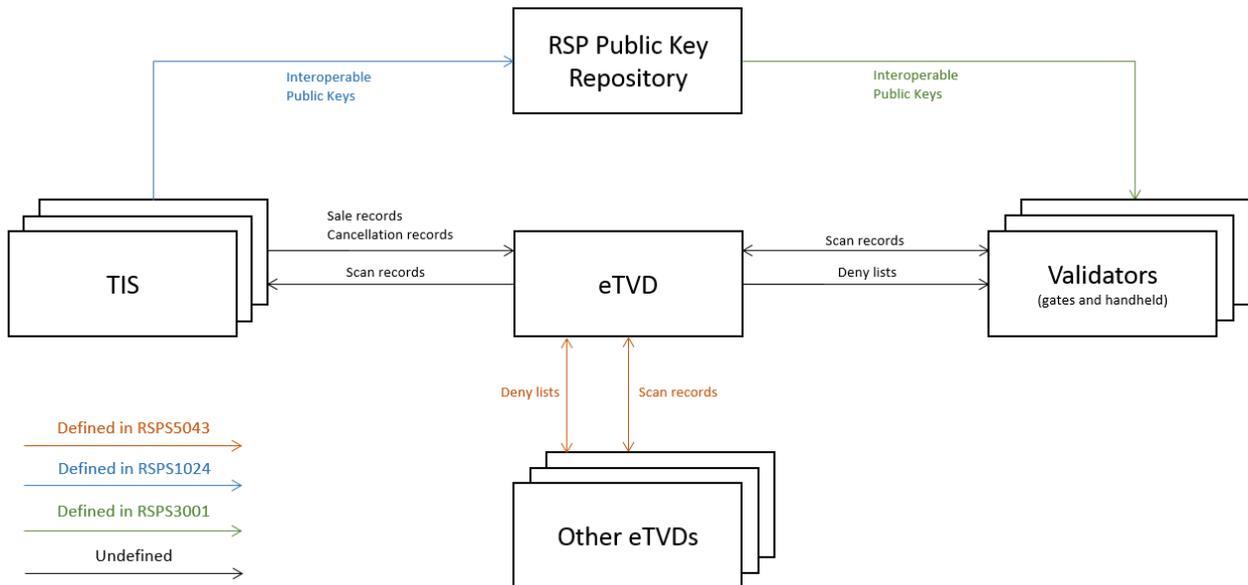2.2   In addition, interface messaging defined by RSP Compliance Standards is identified by a colour key.

Figure 1 - Interoperable Barcode Ticketing Ecosystem

3. Systems

3.1 TIS

3.1.1 A TIS that can sell and/or fulfil an Interoperable Barcode Ticket must be accredited by RSP.

3.1.2 An Issuing System ID must be assigned by RSP and contained within the barcode.

3.1.3 All Interoperable Barcode Tickets issued under an Issuing System ID must have a different IssuingSystemUniqueEticketNumber element in the UTN. To this end, RSP will issue (at least) one Issuing System ID per Machine Type.

3.1.4 An Issuing System ID must not have multiple encryption Keys in use concurrently.

3.2 eTVD

3.2.1 An eTVD has responsibility to receive, store and distribute messages corresponding to the retailing and validation events of an Interoperable Barcode Ticket.

3.2.2 All parties that retail and/or validate Interoperable Barcode Tickets are required to operate an eTVD for some, or all, of these purposes.

3.2.3 An eTVD ID must be assigned by RSP.

3.3 Validator

3.3.1 A validator has capability to decode and validate the payload of a barcode ticket.

3.3.2 This includes both handheld validators and barcode-enabled gatelines.

3.3.3 To decode an Interoperable Barcode Ticket, a validator must hold the associated Public Key.

3.3.4 A validator must access the RSP Public Key Repository (PKR) in order to obtain the Public Keys used for Interoperable Barcode Ticketing.

3.3.5 Validation is performed against the barcode content as well as a lookup of known scan and cancellation records.

3.4 RSP Public Key Repository (PKR)

3.4.1 The RSP Public Key Repository (PKR) serves the purpose of centrally collecting and publishing all Public Keys associated with Interoperable Barcode Tickets.

3.4.2 A central Public Key feed provides the following benefits:

- A consistent set of Public Keys is held by validators across the rail network

- Assurance that only Public Keys of approved TIS Suppliers are held and distributed

- An efficient process for distributing changes to Public Keys

3.4.3 The PKR will not hold Public Keys used for non-Interoperable Barcode Ticketing. Separate arrangements must be made for these to be held by validators.

4.   Interfaces

4.1   TIS and RSP Public Key repository (PKR)

4.1.1   TIS Suppliers must communicate with RSP for the purpose of:

- Providing the Public Key needed for decoding Interoperable Barcode Tickets

4.1.2   See Section 5.1 of this document for the process of requesting the addition of a Public Key to the PKR.

4.2   RSP Public Key Repository (PKR) and Validator

4.2.1   Validators must obtain Public Keys (directly or indirectly) from the RSP Public Key Repository (PKR) for the purpose of:

- Distributing a central feed of the Public Keys used for Interoperable Barcode Ticketing

4.2.2   Public Key distribution is defined in section 5.2 of this document.

4.3   TIS and eTVD

4.3.1   A TIS selling Interoperable Barcode Tickets must communicate with its TOC/Retailer eTVD for the purpose of:

- Sale notifications
- Cancellation notifications

4.3.2   A TOC/Retailer eTVD must communicate with its TIS, where a TIS performs after-sales processes on Interoperable Barcode Tickets, for the purpose of:

- Scan record notifications

4.4   Validator and eTVD

4.4.1   A validator must communicate with its eTVD for the purpose of:

- Scan record uploads

4.4.2   An eTVD must communicate with its validators for the purpose of:

- Cancellation record distribution
- Scan record distribution

4.4.3   Updates to the cancellation records list must be checked for, and downloaded, whenever connectivity is available with the eTVD.

4.4.4   Validators must submit scan records to the eTVD when connectivity is next established.

4.4.5   By ensuring that a validator submits scan records to their eTVD, all scan records are available to other parties from that eTVD. It is therefore not necessary for an eTVD to communicate with a validator that it does not own.

4.5 Communication between eTVDs

4.5.1   TOCs and Retailers involved in the sale and/or validation of Interoperable Barcode Tickets are required to communicate with one another's eTVD for the purpose of:

- Exchanging scan records

- Exchanging cancellation records

4.5.2   All scan records must be made available to the eTVD of the original retailer of an Interoperable Barcode Ticket.

4.5.3   All communication must conform to RSPS5043 – ETV Database Interface Messaging.

4.5.4   All inter-eTVD requests are to be treated with equal priority.

5.   Key Management

5.1   Key Population

5.1.1   All correspondence to RSP relating to the population of the Public Key Repository (PKR) should be directed to TIS.Accreditation@atoc.org and have "PKR – Update Request" as the title.

5.1.2   Addition of Public Key

5.1.2.1   Only RSP can add Public Keys to the PKR. Requests to update the PKR must be sent to RSP.

5.1.2.2   RSP require live and test Public Keys to be submitted by TIS Suppliers.

5.1.2.3   The following information must be provided in a PKR Public Key inclusion request:

- Company Name
- TIS Name
- Live / Test Public Key
- Issuing System ID
- Contact Name
- Contact email address
- Contact email phone number
- Customer service email
- Customer service phone number
- Public Key (as a PEM encoded X509 certificate)
- Key Start Date
- Key End Date
- Barcode payload of example ticket

5.1.2.4   It is the responsibility of the TIS Supplier to ensure that their entry for inclusion in the PKR is correct and current by notifying RSP of changes in a timely manner.

5.1.3   Rollover of Public Key

5.1.3.1   In the event of encryption key rollover, a TIS Supplier must notify RSP in a timely manner so that the PKR can be updated accordingly.

5.1.4   Withdrawal of Public Key

5.1.4.1   Where a TIS participating in Interoperable Barcode Ticketing has been withdrawn, the TIS Supplier must notify RSP in a timely manner so that the PKR can be updated.

5.1.5   Compromise of Public Key

5.1.5.1   In the event of an encryption key pair becoming compromised, the retailer must notify RSP and not issue further Interoperable Barcode Tickets until a new key pair has been introduced.

5.1.5.2   The retailer is required to investigate and determine the furthest date in the future that a genuine Interoperable Barcode Ticket sale, issued using the compromised Key, could be valid.

5.1.5.3   The compromised Public Key is to be held by validators until this date.

5.1.5.4   The PKR will be updated so that the compromised Public Key is only distributed for as long as a genuine Interoperable Barcode Ticket remains valid.

5.1.5.5   To limit the impact of a compromised Public Key, each TOC's fleet of a TIS (such as portable TIS) is required to have a unique Public Key, and therefore a unique Issuing System ID.

5.2 Key Distribution

5.2.1   All correspondence to RSP relating to access to the Public Key Repository (PKR) should be directed to TIS.Accreditation@atoc.org and have "PKR – Access Request" as the title.

5.2.2 Access to Public Keys

5.2.2.1   Only authorised clients can access the PKR. To gain access, a request must be sent to RSP.

5.2.2.2   The following information must be provided in a PKR access request:

- Company Name
- Product Name
- Live / Test feed
- Contact Name
- Contact email address
- Contact phone number

5.2.2.3   Validator suppliers will be granted access to the PKR.

5.2.3 Distribution Process

5.2.3.1   The set of Public Keys used for Interoperable Barcode Ticketing must be obtained from the RSP Public Key Repository (PKR).

5.2.3.2   The feed may be accessed by validator suppliers directly or indirectly - routed via a TOC eTVD for example.

5.2.3.3   Public Keys held in the PKR must not be altered during distribution to a validator.

5.2.3.4   Clients are required to access the PKR on a daily basis to check for updates to the Public Key feed.

5.2.3.5   Updates to the PKR are expected to be held by all validators within a week.

5.2.3.6   The format of the PKR feed is described in Section 4 of RSPS3001 Barcode Presentation, Key Management and Data Specification.

5.3 Test Keys

5.3.1 A separate instance of the Public Key Repository (PKR) contains the test Public Keys of TIS Suppliers. A test PKR.

5.3.2 Test Public Keys are to be submitted to RSP and managed in the same way as live Public Keys, as described in Section 5.1.2.3 of this document, but with the "Test Public Key" identifier.

5.3.3 The test PKR can be accessed in the same way as the live PKR, but with separate client credentials.

5.3.4 TOCs are to instruct their validator supplier(s) on whether test Public Keys need to be held by their validators.

6.   Retailing

6.1   Product Availability

6.1.1   Interoperable Barcode Tickets can be fulfilled to a variety of media, and each fulfilment method shall have a separate 'Fulfilment Channel' entry in the Retail Control Service (RCS) to allow discrete configuration of each fulfilment method.

6.1.2   For each fulfilment method, acceptance is required from all carriers that may be presented with the product by a customer.

6.1.3   Where expansion of the product range for a fulfilment method is suggested, RSP may require the parties to arrange a controlled pilot of the products prior to permitting wider interoperable usage.

6.1.4   Where a new fulfilment method is suggested, RSP may require the parties to arrange a controlled pilot of the fulfilment method prior to permitting wider interoperable usage.

6.2   Fulfilment

6.2.1   The barcode component of an Interoperable Barcode Ticket must conform to the RSP Type 06 barcode defined in RSPS3001 – Barcode Presentation, Key Management and Data Specification.

6.2.2   The layout of an Interoperable Barcode Ticket must comply with the RSP Compliance Standard(s) associated with the particular method of fulfilment used.

6.3   After-Sales

6.3.1   In the absence of any other information, where no scan records exist for an Interoperable Barcode Ticket, it must be assumed that the ticket has not been used.

6.3.2   A retailer may opt to apply a waiting period beyond the final date of validity (or after a cancellation record is issued) to ensure that no new scan records are received prior to completing a refund.

7. Validation

7.1 Barcode Scanning Validation

7.1.1 Validators apply rules to determine the authenticity and validity of an Interoperable Barcode Ticket and it is the responsibility of the TOC to ensure that validation rules applied by their validators are adequate.

7.2 Visual Validation

7.2.1 Barcode scanning is the primary means of validation; however, some forms of Interoperable Barcode Ticketing contain security features that can be examined visually.

7.2.2 Where barcode scanning is not available, visual inspection should be applied.

End.