REETS-TEN
Activity 4:
Back Office Interfaces

D 4.2 Recommendations to CEN for the on-going work on the IAP for EN ISO 12855

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0   Introduction

The REETS (Regional European Electronic Toll Service) project, co-financed by the EC via the TEN-T funding, aims at deploying EETS compliant services in a cross-border regional project. The project is supported by Austria, Denmark, France, Germany, Italy, Poland, Spain and Switzerland (for details on contribution please refer to Table 1 in the annex section).

The subject of Activity 4 (Work Package 4) of the project is the back office interfaces used for the data exchange between Toll Chargers (TCs) and EETS Providers. In particular, the Activity has examined the extent to which EETS implementation would be made easier through the use of standardised interfaces. The potential benefit of this would be to reduce as far as possible the divergence of approaches, thereby reducing both the costs and the possibility to deal with different test systems.

Consequently, the main objectives of WP4 are:

1. to develop common interface communications suitable for use in the DSRC and in the GNSS schemes, based on the standard EN ISO12855:2012,
2. to provide input to the CEN work item on further specification of the IAP for EN ISO 12855 standard
3. to define suitable and common security policy elements for the specific EETS environment

In order to proceed, Activity 4 has been divided into two sub-activities:

- 4.1 - Back Office Interfaces: dedicated to the possible harmonisation of the interface content and interface processes, possibly creating a concept for a common interface test system. Deliverable D4.1 has been created within this sub-activity.
- 4.2 - Security Policy: dedicated to the assessment of individual security requirements of toll domains a potential harmonisation of security requirements in order to identify a minimum set. Deliverable D4.3 has been created within this sub-activity.

To achieve the WP4 objectives, the provisions of the standard EN ISO 12855 have been used as the basis for assessing the current state of the ongoing and/or planned implementation of back office interfaces within the toll contexts of the participating TCs.

The first step was to analyse in detail the state-of-the-art of the back office interfaces in the existing toll domains, with their related business processes used or foreseen by the TC. After which, the second step was to analyse the individual security requirements needed for the definition of a security framework. The group then produced this D4.2 deliverable to submit inputs to the standardization bodies in order to help their work related to the production of documents that, in the MSs, have been at least recognized as basis for the development and deployment of EETS migrating from the current state of art.

0.1   Document objectives

In particular, this document is addressed to the CEN standardisation body (especially CEN TC278 WG1). The document should be considered as being provided from the perspective of supporting the current work for the identification of application profiles in the different scenarios of data exchange between TCs and SPs, as defined in the EN ISO 12855. In the opinion of the TCs and EPs participating in the REETS project, the resulting consolidated description and analysis of the state of the art for the definition of the back office interfaces in the TCs and SPs business may be of added value for CEN. It represents a supplementary perspective to the individual work done up to now by Member States as single participants in the CEN WG for the realization of Interoperable Application Profiles.

With regards to the security policy, this document reports suitable and shared security elements in order to identify a REETS security policy. The project has taken as a guideline the definition of security policy content provided in clause 5.1 of ISO/IEC 27002 to develop some main policy elements.

0.2   Methodology

The work done by the group in D4.1 and D4.3, especially the findings and conclusions, has been analysed and discussed among the members of WP4. Specific aspects of the results of these deliverables have been extracted and integrated in this document, when the participants reached the conclusion that these aspects offer added value as an input to the work of CEN.

1   Inputs to CEN

The main results derived from the analyses as described in deliverable D4.1 are listed below:

1. Additional information exchanges beyond the scope and use of the information exchanges defined in EN ISO 12855, are required and foreseen by several toll chargers;
2. The Interoperable Application Profile (IAP) for EN ISO 12855 per type of Toll Context (DSRC context, GNSS Context) would contribute to facilitate the future development of the EETS to the entire EU. Moreover it should limit the options of the base standard to be used in an interoperable EFC cluster based on the similarities of existing and planned EETS back office interfaces of the EFC systems as shown in the D4.1.
3. Consequently, the development of profiles in the IAP of EN ISO 12855 should be progressed in order to reduce the number of variants in the implementation of EN ISO 12855. Furthermore, not only the message transaction sequences and data elements should be covered but also profiles covering the underlying business processes. This would lead to reduce the number of possible interpretations of data exchange.
4. In addition to the IAP, at this stage an IAP test standard limited to the test focus "syntax/format" is also recommended. In fact such a test standard could be applied by each actor (i.e. TC and SP) in a preliminary test phase, prior to a first integration test.

The main results coming from D4.3 are the following:

1. Security requirements that can be considered as commonly agreed among REETS participants have been identified. They should be taken into account in the standardization work in order to be possibly identified and inserted in a profile called REETS profile.
2. The standard CEN ISO TS 19299 (upcoming version of EN ISO 16439) should provide guidance about how and on what basic guidelines an EFC security policy for an EFC system (or a cluster of EFC systems) shall be defined. The EFC Security Framework should also describe what parts of such security policy can be developed with regards to the considered framework.

1.1   Back office interface: reference EN ISO 12855 standard

1.1.1   Brief description of profiles

Three profiles are commonly identified:
1. In DSRC-based tolling systems, the TC is responsible for the distribution of information regarding the tolled network and the end-to-end management of the financial process with the Service Provider (profile P1).
2. In GNSS/CN-based tolling systems two major groups are distinguished with respect to the distribution of responsibility for the tolling process between the SP and the TC.

a) TSP-dominant GNSS-systems in which the Service Provider is responsible for the whole tolling process from GNSS positioning until the financial management towards its users and the toll chargers (profile P2)

b) TC-dominant GNSS-systems (profile P3) in which there is a different allocation of responsibilities between SP and TC. The difference is basically that the Toll Charger is also responsible in some cases for the process step of toll event detection, but in other cases only for tariffing.

1.1.2 Interoperable Application Profile on EN ISO 12855

The Interoperable Application Profile (IAP) for EN ISO 12855 should limit the options of the base standard to be used in an interoperable EFC cluster based on several different toll domains. The current document D4.1 shows the similarities and differences of existing and planned EETS back office interfaces of the EFC systems operated by the involved Toll Chargers. Therefore, the general results and findings as well as the detailed analysis of the EETS back office interface in this document may be helpful inputs for the definition of the IAP based on EN ISO 12855.

From the REETS-TEN project perspective, the IAP should:

- cover at least the information exchange provided in detail in chapter **Fehler! Verweisquelle konnte nicht gefunden werden.** from D4.1 as far as they are based on EN ISO 12855 (of course revised version),
- limit if possible the ADU transport protocols to the methods given in clause **Fehler! Verweisquelle konnte nicht gefunden werden.** of D4.1,
- cover the profiles for the underlying business processes to reduce the number of possible interpretations of data exchange,
- take the input from chapter 2 of D4.1 input to complement the three sub profiles defined in the final IAP
  - o Profile 1: DSRC based
  - o Profile 2: GNSS/CN based – SP dominant
  - o Profile 3: GNSS/CN based – TC dominant

1.1.3 IAP test standard

In addition to the IAP, an IAP test standard limited to the test focus "syntax/format" is also recommended. Such a test standard should be applied in a preliminary test phase by each actor, i.e. TC and SP before a first integration test.

1.2 Security framework: reference CEN ISO TS 19299 standard

For the ongoing revision of the Security Framework CEN TS 16439 to the new CEN ISO TS 19299 the following recommendations can be made:

1. The recommendations coming from Chapter 5 of D4.3 are to be followed in the standardisation work and reported in a REETS profile. This would mean to consider the commonly agreed security requirements in the environments of:
   - Information Security Management System
   - Communication Interfaces
   - Data storage
   - Toll Charger
   - Toll Service Provider
   - User
   - Interoperability Management

2. CEN ISO TS 19299 should provide guidance in an informative annex on basic guidelines for an EFC security policy referred to an EFC system (or a cluster of EFC systems). In this annex, the EFC Security Framework should also take into account the proposed REETS security policy as derived from D4.3. (with special regards to the common set of REETS requirements provided in chapter 5) and should also include a short description of the TC in the REETS EFC cluster, for example as provided in annex A.2 in D4.3 .

2 Annexes

2.1 Glossary

No.	Terminus	Abbrev.	(short) description
1	Service Provider	SP	Company / Entity offering the services of an EETS-Provider but not necessarily formally registered as an EETS-Provider. Since the REETS Project shall facilitate the transition to EETS, it is recommended, to generally use "Service Provider (SP)", except if "EETS-Provider shall be explicitly addressed (e.g. in the context of registration).
2	EETS-Provider	EP	A legal entity fulfilling the requirements of Art 3 and registered in a Member State where it is established, which grants access to EETS to an EETS user (see Art 2 b) Decision 2009/750/EC).
3	Member State	MS	EU Member State
4	European Electronic Toll Service	EETS	The abbreviation EETS stands for European Electronic Toll Service. It is a service that enables the payment of tolls with a single contract at a single EETS provider and just one on-board unit throughout the European Union.
5	Regional European Electronic Toll Service	REETS	The REETS-TEN project aims at deploying EETS compliant services in a cross-border regional project. The Project shall cover the electronically toll network of 7 Member States (Austria, Denmark, France, Germany, Italy, Poland and Spain) and Switzerland.
6	Toll Charger	TC	Public or private organisation which levies tolls for the circulation of vehicles in a toll domain (see Art 2 k) Decision 2009/750/EC)
7	User		Physical or legal person who subscribes a contract with a Service Provider in order to have access to EETS compliant services (see Art 2 c) Decision 2009/750/EC).

No.	Terminus	Abbrev.	(short) description
8	On Board Equipment	OBE	The complete set of hardware and software components required for providing EETS compliant services which is installed in a vehicle in order to collect, store, process and remotely receive/transmit data (see Art 2 e) Decision 2009/750/EC)
9	Interoperability constituents		Any elementary component, group of components, subassembly or complete assembly of equipment incorporated or intended to be incorporated into EETS upon which the interoperability of the service depends directly or indirectly, including both tangible objects and intangible objects such as software, see Article 2 of the EETS Decision. Examples of interoperability constituents are on-board equipment (including connected back office systems), roadside equipment (including charging beacons, localization augmentation beacons and enforcement devices), EETS Providers' and Toll Chargers' back-office data exchange systems.
10	Toll		A charge, tax or duty levied in relation with circulating a vehicle in a toll domain (see Art 2 j) Decision 2009/750/EC)
11	Toll domain		An area of EU territory, a part of the European road network or a structure (such as a tunnel, a bridge, a ferry,..) where toll is collected (see Art 2 n) Decision 2009/750/EC).
12	Tariff class		The set of vehicles treated similarly by a Toll Charger (see Art 2 g) Decision 2009/750/EC).
13	Vehicle classification parameters		The vehicle related information according to which tolls are calculated based on the Toll Context Data (see Art 2 q) Decision 2009/750/EC).
14	Certification		Certification is defined as an EETS Provider's or its representative's official written statement that its interoperability constituents comply with the associated specified (technical) requirements.

No.	Terminus	Abbrev.	(short) description
15	Technical accreditation		Technical accreditation covers the technical aspects of the accreditation of an already registered EETS Provider in individual toll domains under responsibility of a Toll Charger (or a cluster of Toll Chargers).
16	Technical requirements for registration		Requirements defined by the Member State responsible for the registration to check against Article 3b of the EETS decision
17	Toll domain independent specifications		Technical specifications for interoperability constituents that are defined by technical standards or other regulations or specifications independently from individual toll domain requirements
18	Toll domain specific specifications		Technical specifications for interoperability constituents that comprise requirements that are specific to the needs of a toll domain
19	Security Policy		A Security Policy is a set of requirements and applicable counter measures specified by the party responsible for the security in a system exposed to threats. These counter measures are based upon a risk analysis of the system in order to protect those data exposed to threats in the relationships between TC and SP.

No.	Terminus	Abbrev.	(short) description
20	Cluster		A cluster of ETC Toll Domains is a set of Toll Domains, interconnected or not, which feature the same or very similar ETC toll collection context(s) in a contractual framework like Memorandum Of Understanding or any other agreement between the Toll Domain representatives, *i.e.* the Toll Chargers. This agreement specifies the rules regarding interoperability and its management within that cluster of ETS Toll Domains; it includes references to mutually agreed and shared detailed contractual, procedural and operational documentation as well functional and technical specifications (particularly, interfaces for OBU // RSE and for Toll Charger // Service Provider central systems). A cluster of Toll Domains may have a unique representative for some common subjects. Relationship between Toll Domains and Service Providers are fixed by bilateral contracts. Common validity periods of bilateral contracts with a given ETC Provider allow the interoperability for the global cluster.
21	Accreditation		The Accreditation covers the whole procedure (contractual and technical) to be successfully fulfilled by a Service Provider in order that its technical system could be accepted on a Toll Domain and that the TC entrusts the SP with the toll collection and the invoicing process to the SU. When the Accreditation is successfully completed, the Service Provider is "accredited" in the relevant Toll Domain.

2.2　Participating Toll Chargers

The following table specifies for each Member State involved in the REETS project the Toll Chargers or name of Service offered and the status of the system's operation respectively the status of the EETS implementation.

MS	Network and Toll Chargers	Description of Service offered in the network	Operational and EETS implementation status
CH	Federal Customs Administration (FCA) for the mileage-related heavy vehicle charge (LSVA)	LSVA specific OBU	• In operation • EETS implementation: ongoing
DE	Federal Office for Goods Transport	German Truck Toll system / LKW-Maut Deutschland	• In operation • EETS implementation: ongoing
F	F1 - ASFA Road Network - 18 Toll Domains (some are interconnected), with common technical and operational ETC procedures coordinated by the "Commission de Télépéage" led by ASFA.	TIS PL for HGV- 5 qualified ETS Providers (Axxès, DKV; Eurotoll, Telepass, Total / AS24); these ETS Providers are also qualified for other Toll domains in Europe. The organization of the ASFA Road Network, with the qualified ETS P, is fully conform to the ETS European scheme as defined by the Directive and the Decision.	• In operation • EETS implementation: ongoing
	F2 - MEDDE – Ministry of Ecology, Sustainable Development and Energy.	Ecotaxe road network	• ECOTAXE for HGV. In standby. • EETS implementation: ongoing
I	Italian network: 23 interconnected Toll Domains, with common technical standards and operational procedures shared among Toll Chargers.	SIT-MP (Italian Interoperable ETC Service for HGV)	• Ready for operation • EETS implementation: ongoing
PL	GDDKiA – General Directorate for National Roads and Motorways	viaTOLL	• In operation • EETS implementation: ongoing
E	Spanish toll network: 34 concessionaires with common technical and operational ETC procedures coordinated by the ETC Monitoring Committee led by ASETA	Via-T ETC system for light and heavy vehicles. Around 60 financial Service Providers and 7 non financial Service providers	• In operation • EETS implementation: ongoing
A/DK	Asfinag+Sund & Baelt (plus Sweden and Norway)	Toll Service Provider (TSP): BroBizz A/S (Denmark) and ASFINAG ETS (Austria)	• In operation • EETS implementation: ongoing

Table 1: participating Toll Chargers and toll domains