ACCEPT Institute

Horizon 2020 ETC 636126

Functional Specifications Interoperable Account System

–

Deliverable 8.1

12 April 2018

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 636126.

1 Introduction

1.1 Introduction & summary

This document describes Deliverable 8.1 and is part of work package 8 '*Interoperable Account System*'.

Objectives

The objectives of work package 8 are:

- to explore and describe a trust-framework for transport operators in which they can trust the accounts of travellers with third party agencies, including those from other countries or regions, without the need to sign up such customers themselves. This trust-framework is both the governance as the technical infrastructure necessary for transport operators, or transport schemes to trust each other and to trust the customers or travellers from that other transport operator or transport scheme;

- to develop standards needed for interoperability of such account systems, such that transport operators can inspect the rights of travellers to use their services (see deliverable 8.3); and

- to integrate and demonstrate such systems within our Lab environment and via (cross-border, or interoperable) pilots. See deliverable 8.2 and the deliverables in work package 11, 12 and 13.

These objectives cannot be met by implementing work package 8 only. They have a strong interdependency with other work packages, like:

- work package 3 for the necessary governance to create the trust framework;
- work package 5 for the Lab environment;
- work package 6 for the interoperable hub;
- work package 9 for the interoperable traveller interface;
- work package 11 and 12 for the cross border pilot between Germany and The Netherlands; and
- work package 13: pilot Luxembourg.

Summary

This document describes the functional specifications of the Interoperable Account System. This system connects to the ACCEPT EcoSpace Core Software via different API's. We used relevant input (documents) from our project partners to define the functional specifications, as they are responsible for the implementation of the different account systems, used in the ETC project. The result is an overview of the functional specifications, which can be used for implementation of such a system.

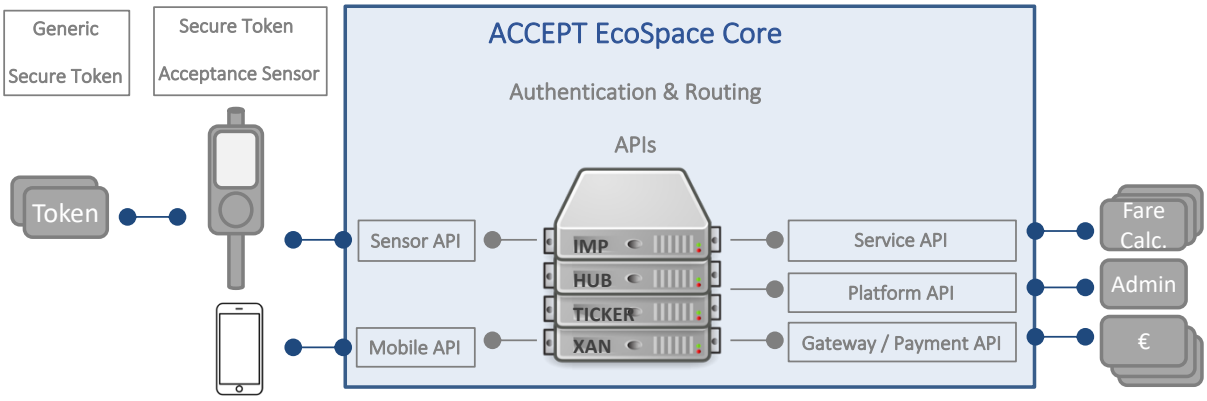
2 Content

3 Interoperable Account System and Eco Space

This chapter describes the relation between the Interoperable Account System and the overall Eco Space Core Software, the heart of the European Travellers Club system.

3.1 ECO Space Core Software

Below a high-level description of the ACCEPT EcoSpace Core Software is presented. It starts with an overview of the logical components, followed by the overview of the APIs and the micro-services.



3.2 Logical Components

The EcoSpace Core Software consists of the following **logical components**:

- IMP:
  Identity Management Platform for Private, flexible and intuitive Account Creation with facilities for binding tokens, services, payment methods to a person's avatar.

- HUB:
  High speed transaction authentication and validation, routing and processing hub that masks identity and supports complex processing for multi-legged transactions.

- TICKER:
  Real time transaction overview showing individual consumption of services with Tokens/IDs in the field, a running record of everything tapped.

- XAN:
  Transaction Acceptance Network, with methods for onboarding tokens, devices, people, services, and payment methods and monitoring their performance and service levels in real time during operation.

3.3 APIs

Furthermore, the EcoSpace Core Software consists of the following **set of APIs** for development and integration of external solutions:

- MOBILE API:
  Account Creation, APP creation, Ticker Views.

- SENSOR API:
  For device makers to attach their devices (*secure token acceptance sensor*[1]) to the XAN.

- SERVICE API:
  For services like Fare Calculation, Park&Ride, ticketing systems and other often travel related multifunctional services such as rentals and in-station lockers.

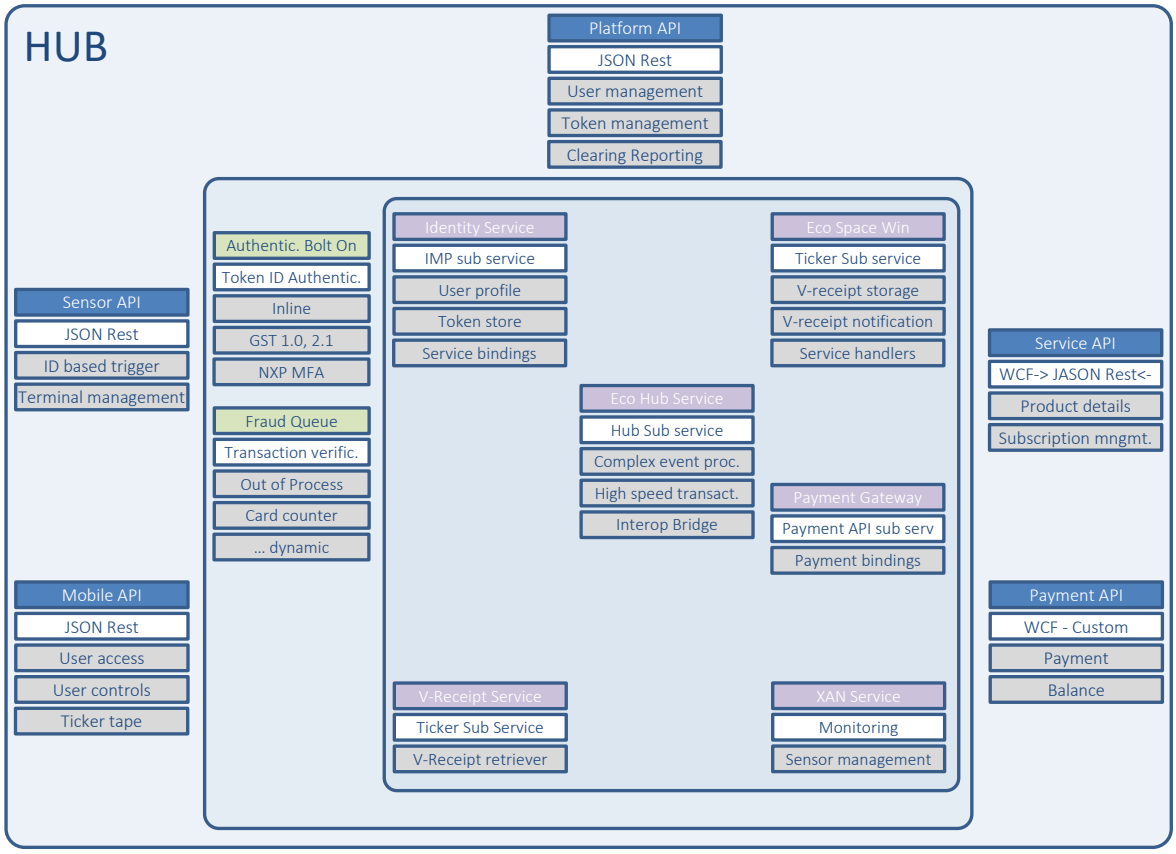
- GATEWAY / PAYMENT API:
  High speed secure router for normalizing custom developed bank connections to a universally consumable payment method.

[1] The specification of the necessary software in the Secure Token Acceptance Sensor (STAS) is described in the document: "Secure Token Acceptance Sensor *Behavior and Interface Specification*). This document provides the interface specification between the STAS and the ACCEPT EcoSpace Core and the interface between the STAS and the Generic Secure Token (GST) ID.

- PLATFORM API:
  To afford users of the Platform API (owners of a particular Hub) access to administrative functions related to Account Creation, Token Registration, and Transaction Reporting.

3.4 Micro Services

Logical components such as IMP, HUB, Ticker and XAN, are comprised of underlying **micro services**.



3.5 Interoperable Account System

The Interoperable Account System, connects through:

- the Service API,
- the Platform API, and
- the Payment/Gateway API.

to the Eco Space Core. These APIs are further described in Deliverable 8.3 of this work package.

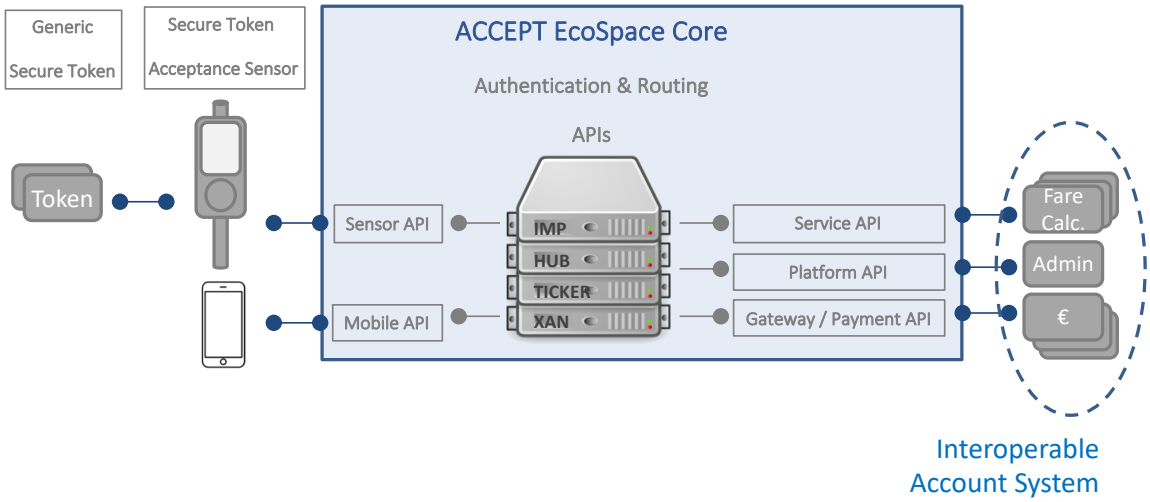
Deliverable 8.2 shows examples of implementations of the Interoperable Account System in the ETC project.

This document further describes the functional specifications for the Interoperable Account System.

4 Functional Specifications

In this chapter the high-level component overview of an Interoperable Account System is presented, followed by the non-technical requirements.

4.1 High Level Component Overview



The components of an Interoperable Account System:

- User Database: Database that holds all users, partners and administrators
- User Management System: Application that can be used by the back office for user management.
- Travel Rights Storage or Calculation. This could be a Fare Calculation Engine: system that calculates the billing, based upon the business rules, for the end-users. Or this could be a ticket stock, where (pre-purchased) tickets are stored.
- Customer Portal: Portal where users can register and select services and view billing.
- Service Provider Portal: Partner portal where billing of transactions can be viewed and downloaded.

4.2 Functional Specifications

The functional specifications can be divided into:

- User Database
- Customer Portal
- User Management System
- Payment Methods
- Travel Rights; price calculation and storage

5 User Database

A Traveller creates an account in the User Database to store:

- their personal profile data,
- their payment methods of choice,
- the collection of travel and other (multifunctional) services they wish to subscribe to, and
- the personal identifiers (e.g. Near Field Communication Cards) they wish to employ for consumption of these services.

ETC User Accounts guarantee interoperability by being universally unique upon issuance, yet they are issued locally by the ETC members.

5.1 Functional requirements for the User Database

The user account should be online accessible.

The user accounts should have a unique identifier (UID) for each traveller and a password (PWD). Examples of a UID are, example given:

- email address; or
- card identification number (engraved ID).

Be creatable via a local ETC member customer facing systems: customer portal (web), or via smartphone app.

Support Single Sign On (SSO) integration with existing ETC members customer accounts.

Protect the privacy of account holder when subscribing and consuming services.

Protect the privacy of account holder when subscribing and consuming payment methods (subject to the confines of the financial KYC regulations).

6 Customer Portal

The Customer Portal is the web interface where the traveller can create his account in the Interoperable Account System.

6.1 Functional Requirements

The registration of a traveller has to be made as frictionless as possible;

The traveller should be able to create UID (unique identifier);

The traveller should be able to connect his UID to his personal identifier (Generic Secure Token) on his Near Field Communication card;

The GST on his smart card is identified by the engravedID on the smart card;

The traveller should be able to select different services (like pay-as-you-go, travel with ticket, other services like bike rental, parking etc.);

The traveller should accept the (different) Terms&Conditions and Privacy Policy from these different services;

The traveller should be able to select payment methods (see chapter 8 of this document). Multiple payment options should be made available;

The Customer Portal must comply with the EU General Data Protection Regulation (GDPR). Regulations that specifically have impact (but not limited to) on the system:

1. Specific consent must be given by data subjects and must be captured by the system.
2. Travellers younger than 16 years must get parental approval before they can use the MMCP system.
3. All data that is classified as personal identifiable information must be stored and processed in such a way that it complies with the GDPR.
4. The operational vendors must agree and with the Data Processing Contract to be delivered by Verkéiersverbond.

7 User Management System

The User Management System is the main CRM system for customer data storage. This system with connected User Database will be filled and kept up to date through a customer portal.

System Administrators and User Operators should have access to the secure account system to manage user profiles.

7.1 Functional Requirements for the User Management System

As there are many solutions available, we have defined the *minimum functional requirements*:

- Storage and operations in compliance with the EU General Data Protection Regulation (GDPR).
  Regulations that specifically have impact (but not limited to) on the system:
  1. Specific consent must be given by data subjects and must be captured by the system.
  2. Travellers younger than 16 years must get parental approval before they can use the system.
  3. All data that is classified as personal identifiable information must be stored and processed in such a way that it complies with the GDPR.
  4. Third party vendors/suppliers must agree with the Data Processing Contract.

- Functionality supported:
  - Search user
  - View user
  - Create user
  - Reset password user
  - Disable user
  - Enable user
  - Delete user
    When a user is deleted, the user can be deleted, but the transaction cannot be removed. Anonymization of user related record
  - Clone user & edit
  - SEPA Validation Checkbox

- Reporting functions supported:
    - Dashboards with basic reporting KPI

8 (Interoperable) Payment Methods

Multiple payment options should be made available in the system to support the traveller with the most seamless travel experience possible. Both the secure connection with local Payment Methods as well as the interoperability of payment methods and fund transfer during 'foreign' travel.

Possibilities of payment options may include, but not limited to:

1. Credit Card
2. Debit Card
3. SEPA Direct Debit
4. PayPal

8.1 Foreign Travellers

There are three options for foreign travellers wishing to pay for ABT services they consume abroad:

a) Adopt a local payment method for the duration of their stay.

b) Adopt a central payment method acknowledged by all or at least the destination Travel Scheme.

c) Continue using 'home' payment method to consume services abroad.

9 Travel Rights: Price calculation and Storage

9.1 Ticket Pouch

Travellers who pre-purchase a travel ticket will need to store and display their tickets. Tickets need to be stored in a Ticket Pouch, or online ticket stock.

For this purpose, a Ticket Pouch should be in place that:

- can store pre-purchased tickets;
- can meet the display and human/ machine validation requirements of participating Travel schemes (e.g. Barcode, 2dcode).

9.2 Price Calculation Engine

Services which have pay-as-you-go as a basis for payment for services used, or travels made, should have an (online) price calculation engine.

This price calculation engine should be able to calculate prices based upon (local) business rules, eg.:

- be able to calculate prices based upon check-in only
- be able to calculate prices based upon check-in and check-out