Horizon 2020 ETC 636126

Showcase Lab

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Deliverable D5.3

06 May 2016

1. Showcase Lab

The deliverable is described in the Grant Agreement as "A showcase for the pilot teams and stakeholders in the Lab."

This Deliverable is part of work package 5: Expand Travel Lab & Develop Use Cases.

1.1. Goal of the European Travel Lab

The goal of the European Travel Lab of the ETC is to support development of reliable real-world prototypes, specifically connected Account Based Ticketing (ABT) solutions featuring a multitude of moving parts, that are based on the ABT Use Cases required for the three separate country ABT Pilots.

1.2. Development within the European Travel Lab

The Travel Lab was set up by Open Ticketing Institute (OTI) to operate in a basic standalone environment with test token IDs, test terminals and emulated travel, payment and multifunctional services.

In the ETC program the following development has been done in the Lab:

- A secure cloud based Hub is added to extend the Lab environment to the net and securely connect it with the Netherlands, Germany, and Luxembourg Travel Scheme's test environments for integration and testing of their 'local' travel services and payment methods in the Lab. See for more information about the Hub deliverable 6.2 and 6.3 of the ETC program.

- The Lab *testbench* is extended to monitor all net based segments in the chain of an end-2-end ABT 'roundtrip'. Thereby aiding participating development teams in the speedy discovery and identification of issues within individual segments. Addressing these issues early on in the prototyping phase versus during Pilot is key to success.

- Above development has provided a working test environment for multi-party iterative design, refinement of account creation, integration of travel & multifunctional and payment services, benchmarking of terminal hardware and embedded software and the vetting of the multi-token Token IDs planned for the three separate pilots in the ETC program.

- A staging server is added to the Lab. As the ETC 'central system' components come online from Authentication & Routing Hub & Token ID Management, and the new version of the GST (Generic Secure Token) these will be integrated and released onto this staging server.

- The Lab also functions as a showcase for displaying the currently defined ABT use cases, and acts as a meeting center for the sharing of knowledge with relevant stakeholders (like transport authorities, transport operators, consumers etc.).

- Finally, the Lab is ready to function as the end-to-end testing platform.

1.3. Next step within the European Travel Lab

During the next months in the ETC program, the following is added to the Lab:
- Once the Pilot demo system components from Interoperable account systems and Interoperable Traveller Interface (Journey Planning, Account Based Ticketing and Travel Info) are ready they will be integrated as required.

- The Lab will be developed further during the project. New functionality and content will be added. We will also publish the status on the ETC website (europeantravellersclub.eu).
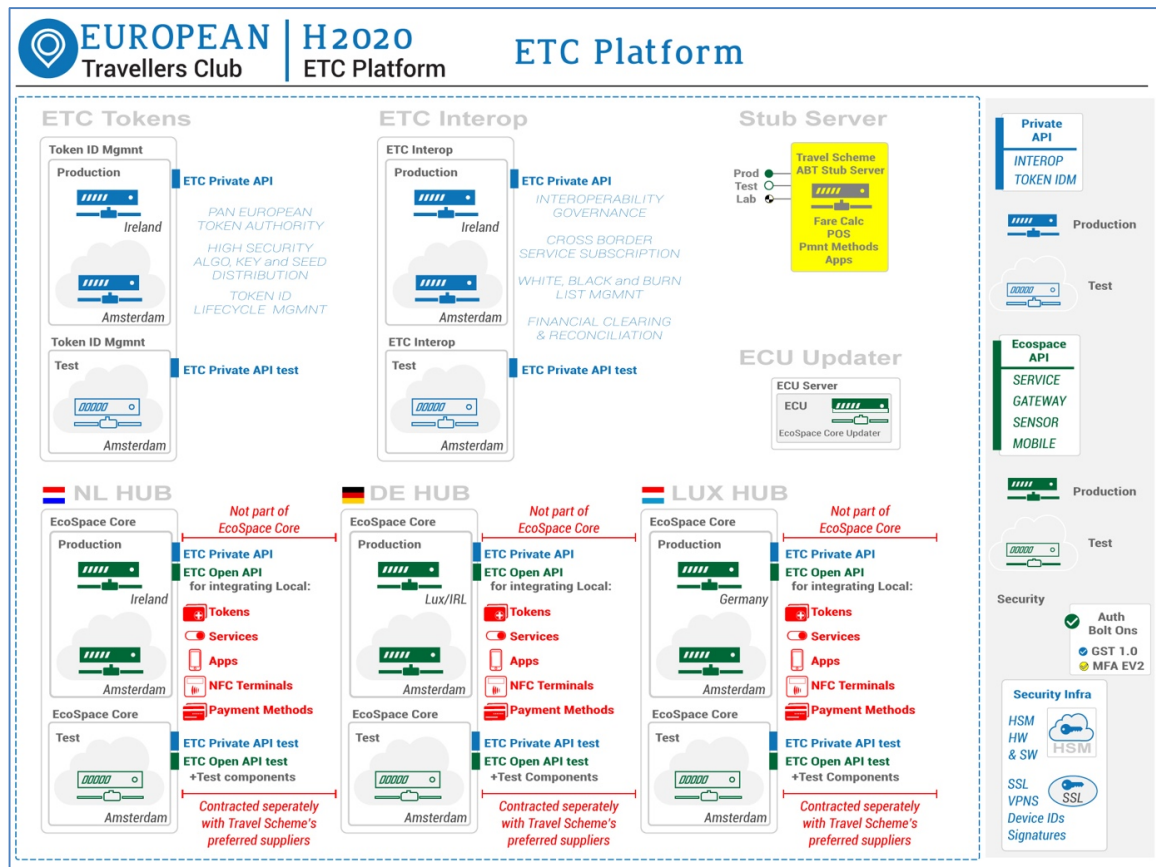
1.4. The European Travel Lab

Below some pictures of the European Travel Lab are presented:
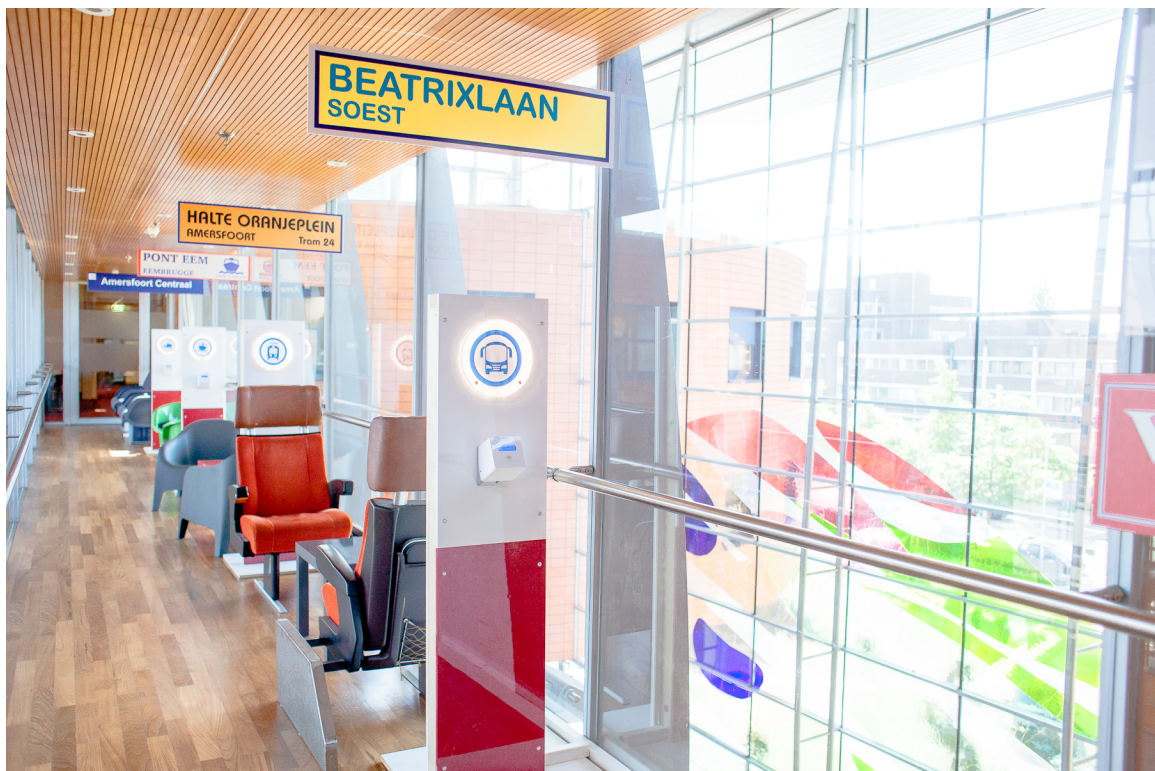
2. The architecture of the ETC Platform and Lab

The ETC Platform, consists of a Token ID Management Module to distribute unique side tokens to Legacy Travel Cards, an Interoperability Hub to allow Travel Scheme Travellers to travel in between participating Travel Schemes based upon Inter-Scheme travel agreements and a series of Travel Scheme Hubs to allow each Travel Scheme to attach their preferred Cloud Ticketing and Cloud Payment services locally.

The ETC Platform is brought up in a test configuration (see red server in diagram) to aid the participating Travel Schemes in their iterative technical integration activities. Preceding the Pilots in the three countries, a Production Environment for the ETC Platform (green servers) will be brought on-line for real world latency testing and ultimate promotion of the Pilot Components developed in the ETC Test Platform to the production environment.

The constant presence of an ETC Test Platform, makes it a perfect conduit for displaying the latest developments along the way of the various Pilot Use cases in the European Travel Lab.

2.1. Travel Lab Software

Token ID Module

The Token ID Module, for unique distribution of ETC Token IDs (currently supports MFA and GST 1.0, GST 2.12) has been brought online in the the ECT Azure Test Cloud, and can be accessed by the Travel Lab via the Travel Lab Bridge.

Interop Server

The Interop Server, for communications between Travel Scheme's local Hubs and Services has been brought online in the the ECT Azure Test Cloud, and can be accessed by the Travel Lab via the Travel Lab Bridge.

EcoSpace Cores Lab + Test

The Travel Lab employs the same EcoSpace Core + APIs, Licensed by the ETC, for use in the ETC Platform. Instances for the Travel Lab Travel Schemes are hosted locally in the Lab. The Target Platforms for the Pilot participants (NL, DE, and LUX) can be accessed by the Travel Lab via the Travel Lab Bridge.
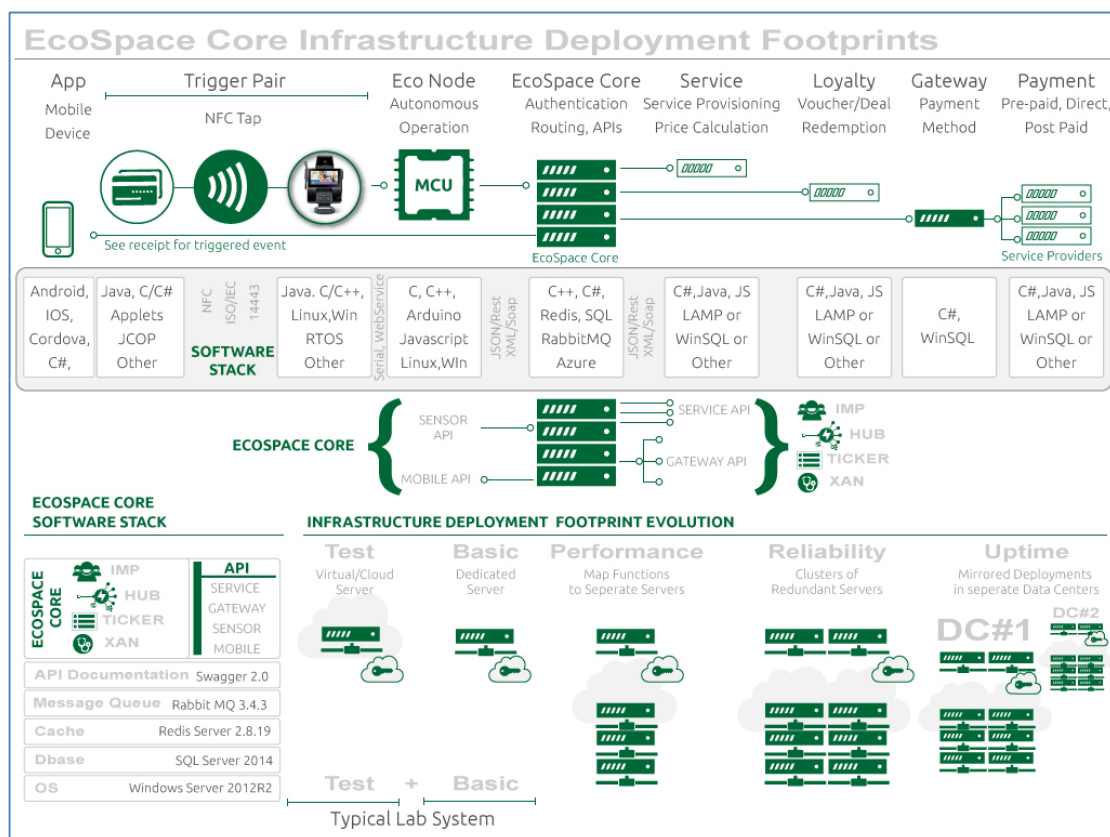
Eco Space Core Components

- 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.

Eco Space Core Component APIS

The functions of these internal components are exposed via 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 scanning devices to the XAN
- SERVICE API: For services like Fare Calculation, Ticketing systems and other often travel related multifunctional services such as P+R, In-station Lockers and Rentals.
- GATEWAY API: High speed secure router for normalizing custom developed bank connections to a universally consumable payment method.

2.2. Travel Lab Bridge

A Travel Lab Bridge is connected with the ETC Test Platform to allow the creation of dedicated Pilot experience points within the Lab for the purposes of user panels and exhibition. This in turn mitigates duplication of test bench monitoring efforts as the Travel Lab Testbench will be utilized to monitor both the 'stubbed out services' as well as the actual pilot services as they are developed and gradually deployed. Thereby giving an accurate window on the progress made on pre-pilot deployments.
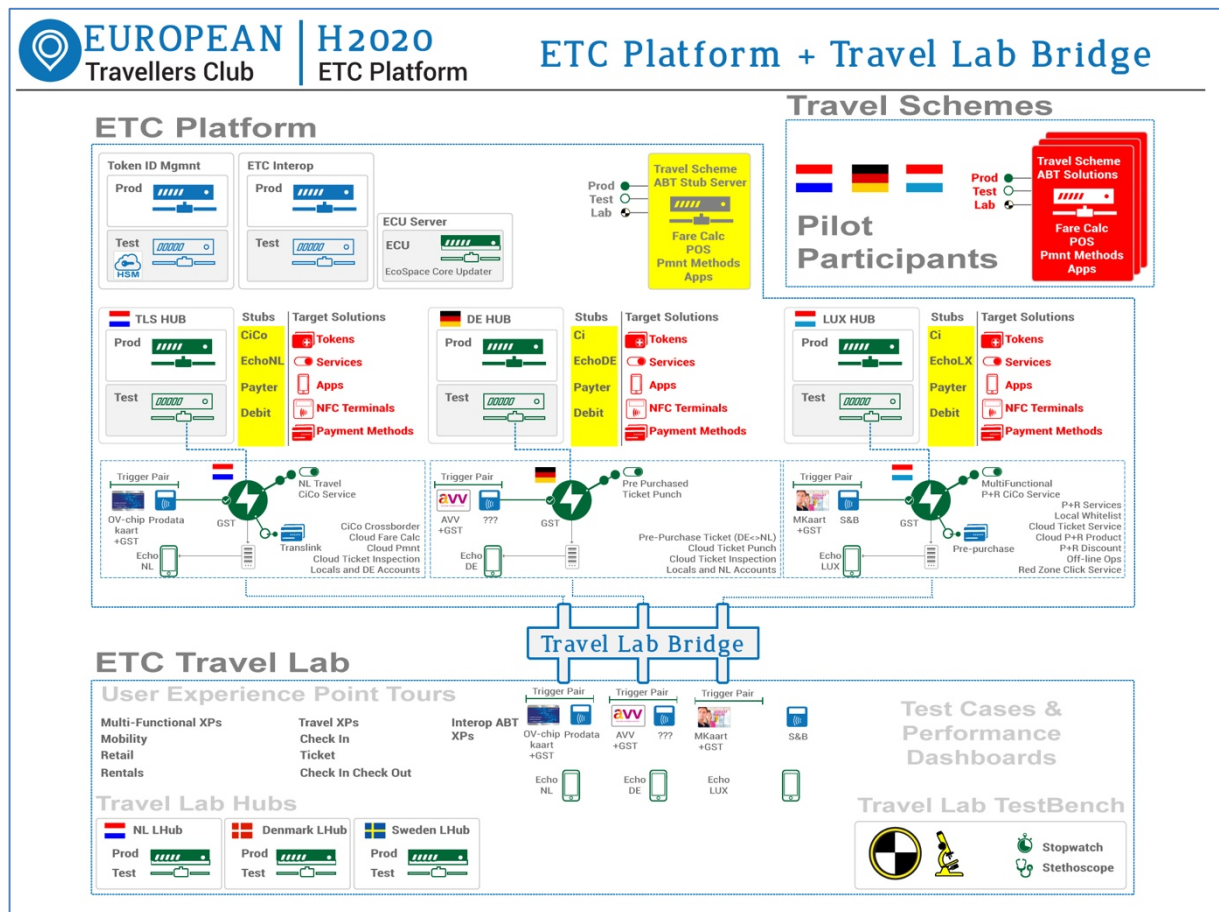
Travel Lab Local Hubs

The Travel Lab hosts three local hubs to show Multi-functionality and Interoperability in the Travel Lab Experience Points through-out the Travel Lab.

Travel Lab TestBench

The Travel Lab Testbench can monitor performance and health of system components associated with an EcoSpace connected solution. It monitors transaction completion times (latency) for both roundtrip segments as well as complete roundtrips. It is also capable of monitoring the health of a given EcoSpace by monitoring component and service heartbeats and/or issuing sparks to components and services that don't support heartbeats natively.

Travel Emulation

Scripts will be developed to emulate geo-spatial transactional traffic (including bad flow) expected in the Pilots to assess performance under load, and exception handling.

ETC ABT Staging Server

The ETC ABT Stub Server will host 'stub' services relevant to the 3 Participating Travel Scheme Pilot Use Cases, in the stead of the actual Travel Scheme services destined for integration later on. These Travel Lab reference use case stub services will be integrated directly with the ETC Test Platform, and ported back to the Travel Lab to avoid needless duplication of hardware and software resources and reconfiguration as the Travel Schemes eventually integrate their own Pilot services for fare calculation, ticketing, mobile apps and payment methods.

The ETC ABT Stub Server is brought up in a separate Azure Test Environment (to be configured for hosting initial 'placeholder' stub services), connected to the Pilot Test Hubs, and thereby made available for display in the Travel Lab via the Travel Lab Bridge.

2.3. Pilot Participant Guidelines for Showcasing in Travel Lab

As Pilot participants design, prepare, produce and start testing their ABT Target Solution Elements. These include Cards with Side tokens, Apps, Upgraded Terminals, their ABT ID based Services (for Fare Calc, Ticketing, Inspection) and their Payment Methods of choice. They will be asked to provide both samples of Cards, Terminals and Apps for display in the Travel lab as well as providing two and finally three instances the ID based Services and Payment Methods they elect to deploy for connection with their local ETC Platform 'Hub'. This can be done by specifying a different end point per service instance and will result in the ability to display the ABT service in the Travel Lab.

Pre-Pilot

Two Instances of each ABT service for connection with:
  a. The Travel Lab Environment – for display in Lab; these are typically the last stable version of a participant's ID-based service.
  b. The ETC Test Environment - for general integration testing; these are the newest as yet untested Service instances.

Pilot

Pilot Participants are expected to host an additional instance of each ABT service for the actual pilot production environment to be connected with their Local ETC Platform "Hub" in the Production environment.