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EBSI Wallet Conformance Testing

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The EBSI Wallet Conformance Testing service is intended for third-party application providers developing a digital wallet that want to ensure the interoperability and conformance of their wallet(s) with the specifications defined by the European Blockchain Services Infrastructure (EBSI).

Disclaimer

By having their wallet listed as an EBSI-conformant solution on EBSI's website, the EBSI team confirms that a specific wallet fully abides by the EBSI core services specifications and the technical specifications based on [W3C Verifiable Credentials](#), [DIDs](#) and [GDPR](#). This conformance testing does not include a security assessment of the wallet, nor a security certification.

Definitions and acronyms

Here you will find an overview of key terms used in this document:

<https://ec.europa.eu/cefdigital/wiki/x/TAfvB>

Here you will find an overview of key acronyms used in this document:

<https://ec.europa.eu/digital-building-blocks/wikis/x/AwBXHQ>

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1. INTRODUCTION TO THE EBSI WALLET CONFORMANCE TESTING SERVICE

This document describes the Wallet Conformance Testing service provided by EBSI. It introduces the purpose of the service, its users, its scope, its benefits, the related roles and responsibilities, the data being created, stored or exchanged as well as who creates it and the overall process.

➤ Follow the link below to access the Wallet Conformance Testing service: <https://ec.europa.eu/digital-building-blocks/wikis/x/LolVHQ>

1.1. Objective

The goal of the EBSI Wallet Conformance Testing service is to verify that third-party wallets conform to the:

- **EBSI core services specifications (1.1.1):** this will assess if a wallet can correctly interact with the core services endpoints of EBSI. In simplified terms, that wallets' requests are well formed and that the core services return a successful answer;
- **EBSI playbook of Verifiable Credentials and their lifecycle (1.1.2):** this will verify that a wallet can correctly interact with Issuers of Verifiable Credentials (VC) and Verifiers of Verifiable Presentations (VP).

1.1.1. EBSI Core Services Specifications

This set of tests will assess if a third-party wallet is able to communicate with EBSI via its APIs. For example, a wallet must be able to interact with EBSI's [DID Registry API](#). This register is a generic core service of EBSI enabling wallets to resolve EBSI Decentralised Identifiers (DIDs).

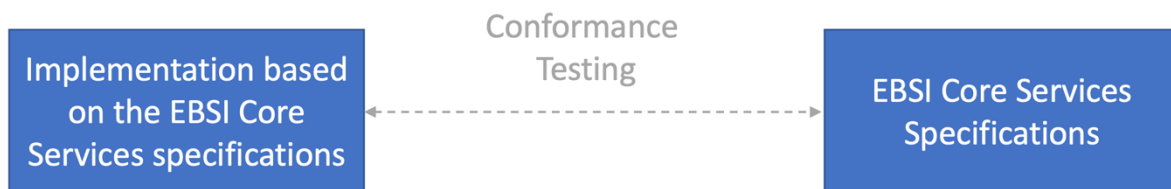


Figure 1 – EBSI Wallet Conformance Testing

The EBSI team provides ready to use guidelines and test endpoints for each core service and supports the users of the conformance testing service during the entire testing process. The overall approach for testing the conformance to EBSI’s Core Services Specifications is shown in the figure below:

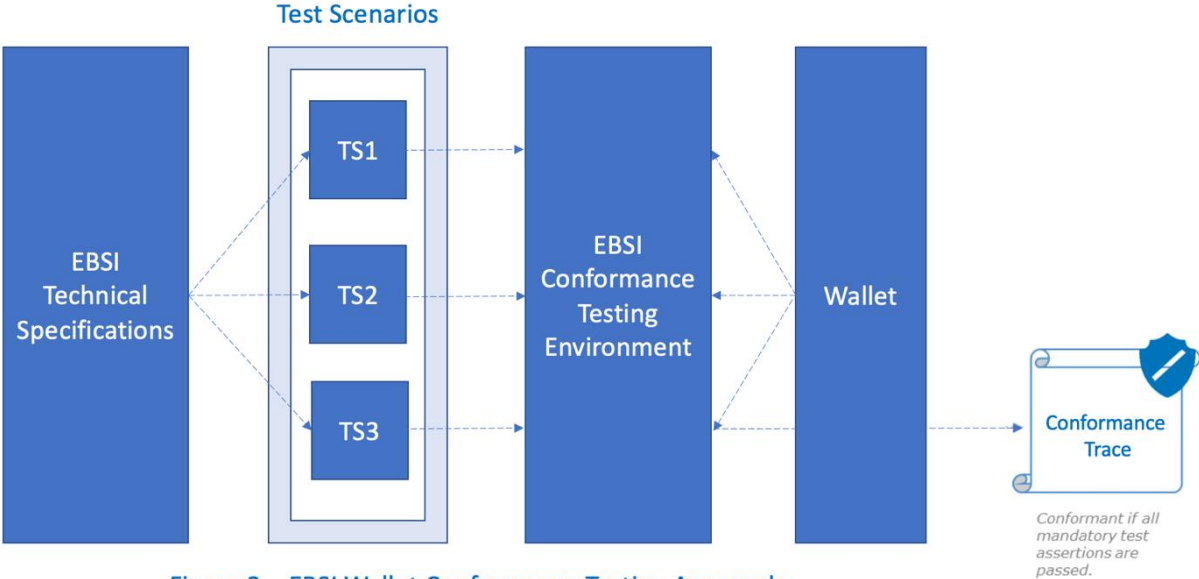


Figure 2 – EBSI Wallet Conformance Testing Approach

These tests will:

- ensure that a given wallet from a third-party developer (wallet app, mobile app, web app, etc.) conforms to the EBSI core services API;
- enable the app developers to self-assess their applications by recording a “conformance testing header” over the core services API;
- enable the app developers to leverage the Conformance Trace and prove the conformance of its app (a specific version with each EBSI APIs (e.g. a specific version of the APIs and test scenario)).

→ To perform the wallet conformance testing, the wallet provider needs to initiate the process by following these steps:

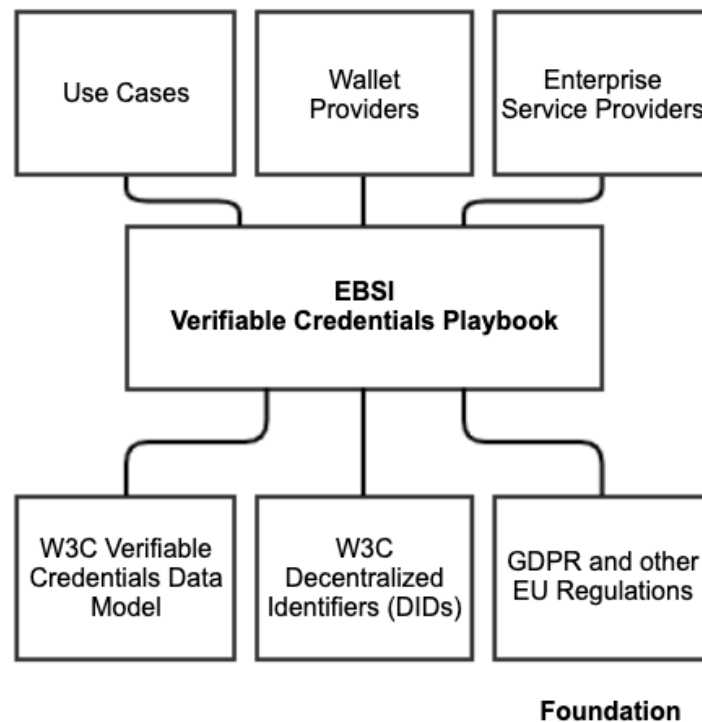
Who	Steps
Wallet provider	<ul style="list-style-type: none"> • defines the conformance testing header containing all information needed to evaluate if a request is conformant as specified here; <i>Note: The conformance testing header attests that a given major version* of a wallet conforms to a given major version* of EBSI;</i> • performs the selected test scenarios as specified here; • contacts the EBSI Support Office to submit the conformance testing header together with the self-assessment spreadsheet and request its anchoring.

* A major version is, as defined per [semantic versioning](#), a version that introduces breaking changes and is consequently not compatible with the previous major version.

1.1.2. EBSI Playbook of Verifiable Credentials (VC) and their Lifecycle

As defined on the [EBSI Verifiable Credentials Playbook](#), EBSI aims to create a generic profile for the full life-cycle of Verifiable Credentials (VC) and Verifiable Presentations (VP) for use cases that involve VCs (not exclusively), building on the [W3C's Verifiable Credentials standards](#), the [GDPR](#) and any other relevant EU Regulations.

The diagram below demonstrates the relations between actors (Trusted Accreditation Organisations [TAO]), Holders, Issuers and Verifiers), use cases, wallet providers, standards, regulations ([W3C Verifiable Credentials](#), [DIDs](#) and [GDPR](#)), and the EBSI VC Playbook.



1.2. Users

The EBSI Wallet Conformance Testing service is intended for **wallet providers**. The service confirms that a wallet solution (a specific version) conforms to the EBSI specifications (a specific version).

1.2.1. [EBSI Core Services Specifications](#)

In the context of the EBSI Wallet Conformance Testing, the only capabilities considered are the ones provided by the wallet provider to the holder, or natural person, who uses the wallet.

Interactions with services, other than EBSI services, or with other actors than the holder, e.g. TAO, Verifier, Issuer, will be mocked by the Wallet Conformance Testing service in order to allow the Wallet Provider to test all interactions with all actors involved in the VC lifecycle.

1.2.2. [EBSI Playbook of Verifiable Credentials \(VC\) and their Lifecycle](#)

For the purpose of the EBSI Wallet Conformance Testing, only the interactions between the holder and EBSI are in scope, as defined in the following test scenarios:

- [Natural Person onboards on EBSI](#);
- [Natural Person requests Verifiable Attestation from an Issuer](#);
- [Natural Person presents its Verifiable Attestation](#).

1.3. Benefits

The EBSI Wallet Conformance Testing service has been designed to provide a number of benefits to the users of the service. These are explained below.

1.3.1. [EBSI Core Services Specifications](#)

One of the benefits of the Wallet Conformance Testing service are that wallet providers can leverage the EBSI API Catalogue. It serves as fully testable core service specifications, which allow wallet providers to test, modify, copy and build their API requests at no cost and in real time.

The additional value for wallet providers is that the catalogue displays conformance-specific endpoints with specific success/error messages, along with detailed guidance to facilitate the completion of the Wallet Conformance Testing processes.

1.3.2. [EBSI Playbook of Verifiable Credentials \(VC\) and their Lifecycle](#)

The table below highlights the benefits for each actors involved in the Wallet Conformance Testing:

Who	Benefits
Wallet provider	<ul style="list-style-type: none">• to confirm to and assure its users that the wallet or implementation is conformant with the specifications of the EBSI Core Services;• to benefit from a testing service supported by professional staff of the European Commission;

	<ul style="list-style-type: none"> • to benefit from a quick testing cycle with reduced cost; • to be able to test anywhere and at any time; • to provide a testing service that is core-service-based and with ready-to-use test cases with a common and standardised plugin; • to provide an easy way to share and verify the conformity of the wallet by anchoring the conformance testing header on-chain on the EBSI network; • to be able to confirm to and assure its users that the wallet is conformant for a given major version* of the wallet (meaning that the wallet needs to go through the Wallet Conformance Testing process each time a new major version* is released).
End users	<ul style="list-style-type: none"> • to have an increased number of EBSI-conformant wallets available to choose from depending on their use or personal preference; • to be sure that conformant wallets behave as expected with the EBSI Core Services for any given major versions* of the wallet and of the EBSI Core Services; • To be able to easily verify the conformity of a specific version of the wallet by checking its conformity for a given major version* of the EBSI Core Services (meaning that the wallet needs to go through the Wallet Conformance Testing process each time a new major version* of the EBSI Core Services is released).

* A major version is, as defined per [semantic versioning](#), is a version that introduces breaking changes and is consequently not compatible with the previous major version.

1.4. Scope

1.4.1. [EBSI Core Services Specifications](#)

The table below presents an overview of the test scenarios, the expected outcomes and the corresponding services offered by the EBSI Wallet Conformance Testing service:

Table 1: EBSI Wallet Conformance Testing service

Test Scenario	Outcome	Definition	Services and Steps
Natural Person onboards on EBSI	<ul style="list-style-type: none"> • User Wallet has been set up. • Natural Person created and securely stored its DID and associated public/private key. • DID is registered on EBSI Ledger. 	See “1. The onboarding of actors supported by EBSI’s blockchain”	<ul style="list-style-type: none"> • API catalogue: Post verifiable authorisation request • API catalogue: Post notification • API catalogue: Post challenge response to get VA • API catalogue: Get notification • Reference implementation • API catalogue: Get schema

		<ul style="list-style-type: none"> • API catalogue: Post authentication request • API catalogue: Post authentication responses • API catalogue: Build tx to Insert did document • API catalogue: Send transaction
<p>Natural Person request Verifiable Attestation from an Issuer</p>	<ul style="list-style-type: none"> • A Natural Person accepts (or not) and stores a Verifiable Attestation in his/her User Wallet. • Optionally, a proof that the relevant Verifiable Attestation has been issued by the Legal Entity is anchored on the EBSI Ledger. • Optionally, a proof that the relevant Verifiable Attestation has been received by the Natural Person is anchored on the EBSI ledger. 	<p>See "2. The issuing and storage of Verifiable Credentials"</p> <ul style="list-style-type: none"> • API catalogue: Post notification • API catalogue: Get notification • API catalogue: Post notification • API catalogue: Get notification • API catalogue: Get schema
<p>Natural Person present its Verifiable Attestation</p>	<ul style="list-style-type: none"> • A Natural Person presented its Verifiable Attestation(s) [VC-Type] to a Legal Entity. • Optionally, a proof that the Verifiable Presentation has been received by the Legal Entity is anchored on the EBSI Ledger. • Optionally, a proof that the relevant Verifiable Presentation has been shared by the Natural Person is anchored on the EBSI Ledger. 	<p>See "3. The presentation and Verification of Verifiable Credentials"</p> <ul style="list-style-type: none"> • API catalogue: Post notification • API catalogue: Get notification • API catalogue: Post notification • API catalogue: Get notification • API catalogue: Get schema

1.4.2. EBSI Playbook of Verifiable Credentials (VC) and their Lifecycle

The table below summarises the scope and actors associated to the testing of the Verifiable Credentials lifecycle:

Steps	EBSI Verifiable Credentials Lifecycle	W3C Verifiable Credentials Lifecycle	Guidelines	Actor
Step 1	Registration and onboarding of actors (Trusted Accreditation Organisation, Holder, Issuer, Verifier)	Out of scope of W3C's Lifecycle.	<ul style="list-style-type: none"> • Onboarding Legal Entities - Learn how Legal Entities on-board on EBSI; • Register Natural Persons - Learn how Natural Persons on-board on EBSI; • Register TAO and TI in Trusted Issuers Registry - Learn how to verify, register, and update Trusted Accreditation Organisation (TAO) information in the Trusted Issuers Registry 	<ul style="list-style-type: none"> • Issuer, TAO, Verifier • Holder • TAO • Issuer
Step 2	Issuing and Storage of Verifiable Credential	<p>Issuance of one or more Verifiable Credentials.</p> <p>Storage of Verifiable Credentials in a credential repository (such as a digital wallet).</p>	<ul style="list-style-type: none"> • Verifiable Credential issuance guidelines - Learn how holders request and issuers issue Verifiable Credentials 	<ul style="list-style-type: none"> • Holder, Issuer, TAO
Step 3	Sharing Verifiable Presentation	Composition of Verifiable Credentials into Verifiable Presentations and Verifiable Presentation exchange.	<ul style="list-style-type: none"> • Verifiable Presentation exchange in a (un)authenticated session - Learn how a verifier requests and holder presents Verifiable Credential(s) using Verifiable Presentation(s) 	<ul style="list-style-type: none"> • Holder, Verifier

		Verification of the Verifiable Presentation by the verifier.		
Step 4	Managing schemas	Out of scope of W3C's Lifecycle.	<ul style="list-style-type: none"> • Managing schemas in the Trusted Schemas Registry - Learn how to verify, register, and manage schemas in the Trusted Schemas Registry 	<ul style="list-style-type: none"> • Issuer, Verifier

1.5. Data

1.5.1. [EBSI Core Services Specifications](#)

In the context of the EBSI Wallet Conformance Testing, the capabilities considered are the ones provided by the wallet provider to the holder, who uses the wallet: please refer to 1.5.2. for full details of who creates, stores and exchanges data.

Important note: no personal data is allowed to be used at any time during the Wallet Conformance Testing.

1.5.2. [EBSI Playbook of Verifiable Credentials \(VC\) and their Lifecycle](#)

The table below presents which data is created, stored or exchanged; and who creates it:

Test Scenario	Done by	Data-related Action	Data	Outcome
Natural Person onboards on EBSI	• Holder	• Sets up wallet	/	• User Wallet has been set up.
	• Holder	• Creates	• DID and associated public/private keys	• Natural Person created and securely stored its DID and associated public/private key.
	• Holder	• Registers	• Transaction	• DID registered on EBSI.
Natural Person request Verifiable Attestation from an Issuer	• Holder	• Requests	• Verifiable Attestation (VA)	• A Natural Person accepts (or not) and stores a Verifiable Attestation in his/her User Wallet.
	• Issuer	• Issues	• VA	
	• Holder			

	<ul style="list-style-type: none"> • Stores (in wallet) 	<ul style="list-style-type: none"> • VA 		
<p><u>Natural Person present its Verifiable Attestation</u></p>	<ul style="list-style-type: none"> • Verifier • Holder 	<ul style="list-style-type: none"> • Requests • Presents 	<ul style="list-style-type: none"> • VC/VP • VC/VP 	<ul style="list-style-type: none"> • A Natural Person presents its Verifiable Attestation(s) [VC-Type] to a Legal Entity.

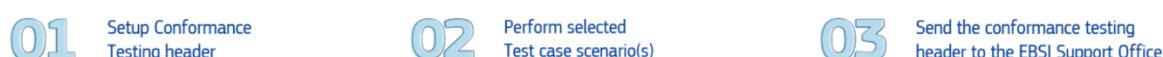
2. HOW TO USE THE SERVICE STEP-BY-STEP

This chapter presents information on how to use the EBSI Wallet Conformance Testing service, including the roles and responsibilities of the different actors involved in it.

2.1. For the wallet provider

The wallet provider commits to integrate its wallet with the EBSI Core Services, and to conform to the EBSI Core Services specifications.

The diagram below summarises the steps that the wallet provider should follow to complete the Wallet Conformance Testing process:



To perform the Wallet Conformance Testing, the wallet provider needs to follow the process defined below:

Who	Steps
Wallet provider	<ul style="list-style-type: none">defines the conformance testing header containing all information needed to evaluate if a request is conformant as specified here; <i>Note: The conformance testing header attests that a given major version* of a wallet conforms to a given major version* of EBSI;</i>performs the selected test scenarios as specified here;contacts the EBSI Support Office to submit the conformance testing header together with the self-assessment spreadsheet and request its anchoring.
EBSI Support Office	<ul style="list-style-type: none">evaluates the conformance testing header together with the self-assessment spreadsheet.extracts the specific conformance trace based on the header provided by the wallet provider,confirms that the tests have been passed, by checking for each test scenario that the relevant tested API and HTTP code match;alternatively, if clarifications are needed, the EBSI Support Office contacts the Wallet provider with questions or corrective measures until the conformance can be confirmed;declares the wallet conformant, once all tests have been confirmed as successful;schedules a conformance testing closing meeting with the wallet provider, once the conformance has successfully been reviewed and verified;

	<ul style="list-style-type: none"> • records the Conformance Trace on-chain with a reference to the unique ID (header UUID) of the conformant wallet, its version, the version of the EBSI core services and test scenarios; • adds the wallet provider company details and logo together with its EBSI-conformant wallet (incl. version of the wallet) to the public list of EBSI-conformant wallets. Each entry is displayed together with the detailed conformance report and test result(s); • sends a confirmation email to the wallet provider detailing the exact date and time of the conformance, its recording on EBSI, and detailed results of the tests performed in a report annexed to the email.
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* A major version is, as defined per [semantic versioning](#), a version that introduces breaking changes and is consequently not compatible with the previous major version.

2.2. For the EBSI Support Office Team

The EBSI Support Office team liaises with the wallet providers interested in testing the conformance of their wallets with the EBSI infrastructure and standards. It has the following responsibilities in the context of the EBSI Wallet Conformance Testing service:

- to liaise with the wallet providers and handle all inbound conformance testing requests;
- to support the wallet providers with every EBSI Wallet Conformance Testing actions:
 - to review conformance test results from the self-assessment spreadsheet and the conformance testing header;
 - to timestamp conformance testing header on-chain on the EBSI network if the wallet is conformant;
 - to add the company details and logo of the wallet provider and its EBSI-conformant wallet to the public list of EBSI-conformant wallets, together with the detailed conformance report and test result(s).

3. TERMS AND CONDITIONS

Please consult the EBSI terms and conditions in the Master Service Arrangement, available on the EBSI website: <https://ec.europa.eu/digital-building-blocks/wikis/x/FAI8HQ>. The table below describes the terms and conditions specific to the EBSI Wallet Conformance Testing service.

Table 2: EBSI Wallet Conformance Testing service - Terms and conditions

Term / Condition	Description
<p>Obligations of the user</p>	<p>It is the responsibility of the user to abide by the Terms and Conditions of the EBSI Wallet Conformance Testing Service Offering Description and the EBSI Core Services specifications.</p> <p>It is the responsibility of the user to ensure that no personal data is used at any time during the Wallet Conformance Testing.</p> <p>The wallet needs to go through the conformance testing process each time the wallet provider plans to release a new major version* of their software OR each time a new major version* of EBSI is deployed.</p> <p>Wallet providers should provide correct company details and logo as specified in the request form sent to the EBSI Support Office.</p>
<p>Delivery of the services</p>	<p>The European Commission will provide the conformance testing services using reasonable care and skill and in accordance with the technical specifications and procedures outlined in this document. The timing of completion of the conformance testing services and the delivery of the test results by the European Commission is based on best effort. The European Commission is entitled to suspend or terminate the provision of the services in case of failure of the user to comply with its obligations, as described above, or any other conditions preventing the successful delivery of the service.</p> <p>Please note that the logs created by the wallet provider for the purpose of the wallet conformance testing service will be erased two weeks after creation. It is advised to request the verification of the results of the tests from the support office as soon as possible.</p>
<p>Warranty disclaimer</p>	<p>The conformance testing services and the result thereof are provided on the basis of the information, documents and implementations supplied by the wallet provider or its organisation. The test report and the recorded log trace</p>

	<p>issued by the European Commission are issued on an AS-IS basis and will reflect the facts as recorded at the time of testing.</p> <p>The European Commission is under no obligation to refer to, or report upon, any facts or circumstances which are outside the scope of this service and the procedures outlined in this document.</p>
<p>Limitation of liability</p>	<p>In no event shall the European Commission be liable to the wallet provider or its organisation or anyone claiming through the user, for any kind of damages resulting from reliance on the test result.</p> <p>If the product/implementation passes all mandatory test assertions, the wallet provider will receive a conformance test report. It should be clear that this test report has no legal value, it is a technical report, outlining the test results based on the version of the test platform and test cases in effect at the time of testing.</p> <p>The conformance test report is restricted to, and only applies to, the specific version of the product that was subject to testing for a specific test run at a specific date. Other products offered by the wallet provider or its organisation or versions of that product which not undergone testing are not considered to be conformant.</p>
<p>Disclosure</p>	<p>The wallet provider is entitled to disclose to third parties the fact that the product/implementation passed the conformance test. Notwithstanding the following conditions:</p> <ol style="list-style-type: none"> 1. There should be a clear mention of the version of the EBSI specifications, the version of the product to which the result of the conformance test applies, labelled with the specific test run and date; 2. The conformance test report can only be reproduced and shared in its entirety; 3. The conformance test report should not be used in such a manner as to bring the European Commission into disrepute and not make any statement regarding the result of the conformance test that the European Commission may consider misleading or unauthorised. 4. The wallet provider agrees to modify or remove part of or the integrity of the conformance test

	<p>report and/or associated communication at the request of the European Commission.</p> <p>5. The conformance test report does not include a security assessment of the wallet, nor a security certification.</p> <p>The user of the conformance testing service agrees to the publication of the test result, including details provided by the wallet provider (wallet provider organisation, website, name of the product, logo) by the European Commission on any material or platform deemed relevant. As the conformant wallets are tested against a specific version of the EBSI specifications, wallet needs to go through the conformance testing process each time the wallet provider plans to release a new major version* of their software OR each time a new major version* of EBSI is deployed. The European Commission will remove wallets that are conformant with deprecated version of the EBSI specifications from any above-mentioned material or publication. Should the wallet provider disagree with the publication of the test result and aforementioned details, a request can be sent to the support office.</p>
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* A major version is, as defined per [semantic versioning](#), a version that introduces breaking changes and is consequently not compatible with the previous major version.

3.1. Limitations of the current service

This conformance testing does not include a security assessment of the wallet, nor a security certification.

4. CONTACT INFORMATION

4.1. How to request the service

As described under section 2.1, the wallet provider should initiate the service by following the detailed steps described on [this page](#).

For the purpose of testing the conformance of its wallet, the wallet provider should connect its wallet with the EBSI Core Services in order to be able to perform the conformance tests and to conform to the EBSI Core Services specifications.

After completing all the steps, the wallet provider should contact the EBSI Support Office to complete the conformance testing process.

4.2. Best practices

The wallet conformance testing is estimated to require up to a week-worth of work of up to two full-time-resources, e.g. two man-weeks, to perform the complete set of tests.

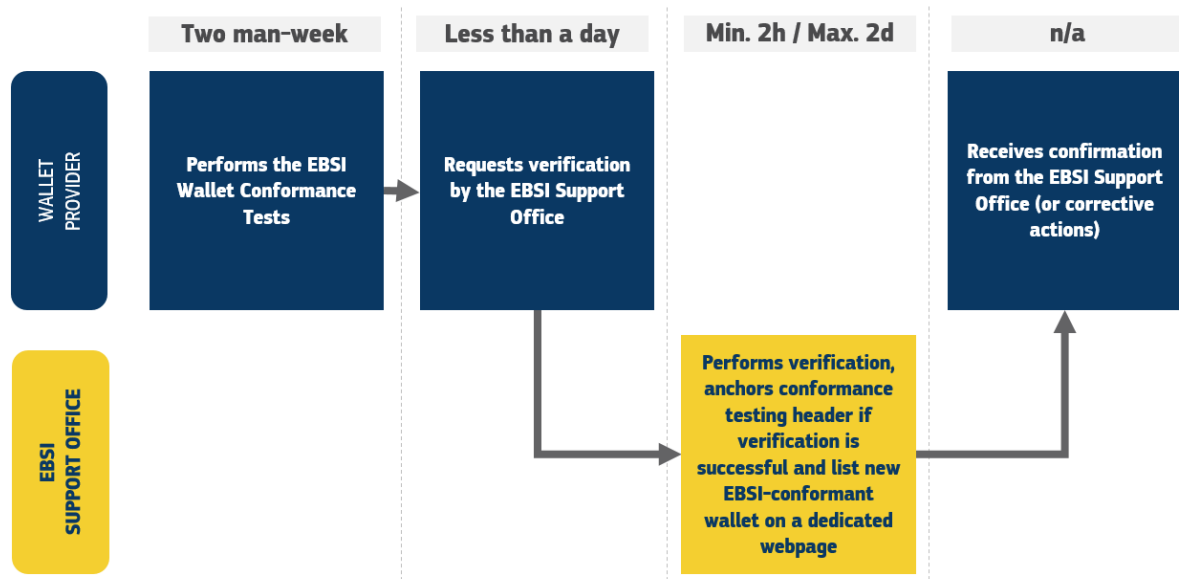
Ideally a small cross-functional team, e.g. two developers or one developer and one tester (or more if available), should be sufficient to perform the tests.

For faster completion time, it is highly recommended that the team is fully focused on the wallet's conformance tests exclusively.

Please note that the **logs created by the wallet provider for the purpose of the wallet conformance testing service will be erased two weeks after creation**. It is advised to request the verification of the results of the tests from the support office as soon as possible.

4.3. Conformance testing flow

The diagram below illustrates the high-level timeline of the Wallet Conformance Testing:



4.4. What will happen if the wallet passes the Conformance Testing process?

After completing all the steps listed in section 2.1 the wallet provider should contact the EBSI Support Office to request the verification of the self-assessment spreadsheet and the conformance testing header, and the anchoring of the conformance testing header.

After the conformance testing header together with the self-assessment spreadsheet has been successfully verified, the EBSI Support Office will schedule a meeting with the wallet provider to review the conformance testing results, confirm which test scenarios were implemented, and confirm conformance of the wallet.

Then, the conformance log trace will be anchored on-chain by the EBSI Support Office, the wallet provider will receive a confirmation by the EBSI Support Office that the conformance testing process has been successful. The wallet provider's company details and logo will be added to the list of EBSI-conformant wallets on a dedicated webpage, together with the detailed conformance report and test result(s).

EBSI Wallet Conformance Testing service:

- [Visit the WCT service page](#)

EBSI Support Team

- [Visit the service desk](#)

Support Service: 8am to 6pm (Normal EC working Days)

