



EUROPEAN COMMISSION

DIGIT  
Connecting Europe Facility

# **CEF eSignature**

## **esig-validation-tests**

Version 1.0

### **User guide**

**Reference documents:**

Reference	Document	Date	Version
QES V-A	<a href="#">Qualified electronic signature (QES) validation algorithm</a>	07/2018	0.2
ETSI 119 001	<a href="#">ESI: Definitions and abbreviations</a>	03/2016	1.2.1
ETSI TS 103 171	<a href="#">XAdES Baseline profile</a>	03/2018	2.1.1

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## PURPOSE AND APPROACH OF THE DOCUMENT

In order to help third parties to validate their implementation of eIDAS requirements regarding electronic signature, the CEF eSignature building block is proposing to publish validation test cases.

As a first step, the focus is on the validation of qualified electronic signatures (QES) according to the *guidelines* “Qualified electronic signature (QES) validation algorithm” document [QES V-A] and following the standard [ETSI TS 103 171] (<https://ec.europa.eu/cefdigital/wiki/display/CEFDIGITAL/e-Signature+standards>).

As a next step, the focus will be to implement more QES test cases as well as AdES ones (according to ETSI EN 319 102-1).

The structure of the document is the following:

First the presentation of the test cases, then a presentation of the web application itself, finally an explanation on how to use and integrate the test cases in a third-party solution.

The targeted audience of the present document are the eSignature solution implementers already aware of the QES validation algorithm and previously quoted standards.

# 1. QES TEST CASES

A qualified electronic signature is an advanced electronic signature which is additionally:

- Created by a private key that is protected by a qualified signature creation device;
- And is based on a qualified certificate for electronic signatures.

Qualified certificates for electronic signatures are provided by (public and private) providers which have been granted a qualified status by a national competent authority as indicated in the national 'trusted lists' of the EU Member State.

Taking this into account and based on the validation algorithm guidelines [QES V-A], a list of tests cases has been identified to allow eSignature solution implementers to validate their solutions.

For each of those test cases, a signed document, a trusted list including a related trust service and a root of trust (a LOTL together with its LOT-signing certificates) are needed.

The identified test cases differ by the variation on the content of the certificates (e.g. qualification statement), the trust service entries content, and the quality of the trusted list (e.g. availability, signature, ...).

An overview of the list of test cases is shown in the figure below. The actual list can be downloaded from the web application itself.

Conclusion	Test case description	sigCert (signing certificate content)	TL (trusted list content)	Fake LOTL / TL entries
<b>Processing the TLs</b>				
AESig w/ warning	2.11 TL signature is not authorized, TL is ignored	QC eSig QSCD	catching CAOC eSig	LOTL-2 TL-21 TSP-21 TS-2.11 SDC-1.1
AESig w/ warning	2.12 TL signature expired before, TL is ignored	QC eSig QSCD	catching CAOC eSig	TL-22 TSP-2.1 TS-2.12 SDC-1.2
QESig w/ warning	2.13 TL has expired (NextUpdate)	QC eSig QSCD	catching CAOC eSig	TL-23 TSP-2.1 TS-2.13 SDC-1.3
AESig w/ warning	2.14 TL is temporarily unavailable, use version in cache	QC eSig QSCD	catching CAOC eSig	TL-24 TSP-2.1 TS-2.14 SDC-1.4
<b>Matching SDI + SuiASt + status</b>				
<b>3.1 Matching service</b>				
AESig	3.11 No matching SDI	QC eSig QSCD	not catching CAOC eSig	LOTL-3 TL-3 TSP-3.1 TS-3.11 SDC-3.11
AESig	3.12 No matching CAQC	QC eSig QSCD	catching CAQC eSig	TS-3.12 SDC-3.12
AESig	3.13 No matching SuiASt	QC eSig QSCD	catching CAQC eSeal	TS-3.13 SDC-3.13
AESig	3.14 Withdrawn	QC eSig QSCD	catching CAQC withdrawn	TS-3.14 SDC-3.14
AESig	3.15 Supervision ceased/... before eIDAS	QC eSig QSCD	catching CAQC superv. ceased	TS-3.15 SDC-3.15
AESig	3.16 Accreditation revoked/... before eIDAS	QC eSig QSCD	catching CAQC accreditation revoked	TS-3.16 SDC-3.16
<b>3.2 Matching service</b>				
QESig	3.2.1 Standard case	QC eSig QSCD	catching CAOC eSeal	TSP-3.2 TS-3.2.1 SDC-3.2.1
QESig w/ warning	3.2.2 No matching TSP Name / trade name	QC eSig QSCD	catching CAOC eSig	TS-3.2.2 SDC-3.2.2
<b>3.3 Incoherences in TL</b>				
error	3.3.1 Several entries matching (simple case)	QC eSig QSCD	catching CAOC eSig	TSP-3.3 TS-3.3.1 SDC-3.3.1
<b>QC / notQC</b>				
<b>4.1 notQC based on sigCert content</b>				
AESig	4.1.1 sigCert not declared as QC	eSig QSCD	catching CAOC eSig	TL-4 TSP-4.1 SDC-4.1.1
QESig	4.1.2 Cert policy before eIDAS	eSig QCP+	catching CAOC eSig	TS-4.1.2 SDC-4.1.2
QESig	4.1.3 Cert policy before eIDAS	eSig QSCD QCP	catching CAOC eSig	TS-4.1.3 SDC-4.1.3
AESig-QC	4.1.4 Cert policy before eIDAS	eSig QCP	catching CAOC eSig	TS-4.1.4 SDC-4.1.4
AESig	4.1.5 Cert policy after eIDAS	eSig QCP	catching CAOC eSig	TS-4.1.5 SDC-4.1.5
AESig	4.1.6 Cert policy after eIDAS	eSig qcp_expired	catching CAOC eSig	TS-4.1.6 SDC-4.1.6
QESig	4.1.7 Cert policy before eIDAS, QCP and QCP+	eSig QCP+	catching CAOC eSig	TS-4.1.7 SDC-4.1.7
<b>4.2 Override to notQC by SuiASt in TL</b>				
AESeal	4.2.1 Catching	QC eSeal	catching CAOC eSeal	TSP-4.2 TS-4.2.1 SDC-4.2.1
AESig-QC	4.2.2 Not catching because of type	QC eSig	catching CAOC eSeal	TS-4.2.2 SDC-4.2.2
AESig-QC	4.2.3 Not catching because of criteria	QC eSig	catching CAOC eSig	TS-4.2.3 SDC-4.2.3
<b>4.3 Override to QC by SuiASt in TL</b>				
AESig-QC	4.3.1 Catching, although sigCert content is notQC	eSig	catching CAOC eSig	TSP-4.3 TS-4.3.1 SDC-4.3.1
AESeal	4.3.2 Not catching because of type	eSeal	catching CAOC eSig	TS-4.3.2 SDC-4.3.2
AESeal	4.3.3 Not catching because of criteria	eSeal	not catching CAOC eSeal	TS-4.3.3 SDC-4.3.3

Figure 1A: QES test cases – List of identified test cases

## 2. WEB APPLICATION

### 2.1. Overview

The screenshot shows the home page of the 'esig-validation-tests' web application. The page is titled 'eSignature validation test cases' and includes a sub-header: 'Test cases for assessing an implementation of eSignature validation, currently mainly focusing on qualified electronic signatures (and seals)'. The navigation path is: European Commission > CEF Digital > eSignature > eSignature validation test cases > Home. The page is organized into a sidebar and a main content area. The sidebar contains three main sections: 'Validation' (with sub-items 'Test cases packages' and 'Trusted lists'), 'Documentation' (with sub-items 'User guide' and 'QES test cases'), and 'Useful links' (with sub-items 'CEF Digital', 'Digital Signature Services', and 'TL Browser'). The main content area is titled 'Home' and contains the following text: 'These test cases have been set up in order to help anyone testing an eSignature implementation (software providers, trust service providers, conformity assessment bodies, supervisory bodies, ...). "Fake" LOTLs, TLs, certificates and signed documents are generated automatically, and refreshed on a regular basis. The test cases currently focus on the validation of the "qualification part" of qualified electronic signatures and seals based on trusted lists, that is excluding the specific test cases related to the validation of an advanced electronic signature or seal according to ETSI EN 319 102-1. For this "qualification part", a list of test cases have been identified: Should you identify missing test cases, or errors in existing ones, please don't hesitate to give us a feedback via the CEF eSignature support team email (CEF-eSignature-support@ec.europa.eu).'. At the bottom, there is a 'Service and Information' section with links for 'eSignature', 'Legal Notice', and 'Support', and a 'Follow us' section with social media icons for Twitter and LinkedIn.

**Figure 2A: esig-validation-tests – home page**

The web application esig-validation-tests is composed of a home page, two main views (1 & 2), documentations files that can be downloaded (3) and useful links (4).

Documentation is composed of:

- User guide: The present document
- QES test cases: The list of identified test cases for QES validation

## 2.2. Trusted lists

According to the algorithm described in [QES V-A] and in order to simulate the existence of qualified trust services, esig-validation-tests has to provide “fake” LOTLs and “fake” TLs.

Because some test cases require dedicated LOTLs, more than one LOTL are generated for the purpose of esig-validation-tests.

The LOTLs and the TLs are **hosted** by the application and should not be downloaded to be hosted locally. This is due to the sheer structure of LOTLs and TLs that contain absolute URLs to each other.

From the “Trusted Lists” web page, the LOTLs and TLs can be browsed and shown below (hyperlinks):

The screenshot shows the 'Trusted lists' page on the esig-validation-tests website. The page header includes the European Commission logo and the text 'CEF Digital Connecting Europe'. The main heading is 'eSignature validation test cases' with a sub-heading 'Test cases for assessing an implementation of eSignature validation, currently mainly focusing on qualified electronic signatures (and seals)'. The breadcrumb trail is 'European Commission > CEF Digital > eSignature > eSignature validation test cases > Trusted lists'. The left navigation menu has three main sections: 'Validation' (with sub-items 'Test cases packages' and 'Trusted lists'), 'Documentation' (with sub-items 'User guide' and 'QES test cases'), and 'Useful links' (with sub-items 'CEF Digital', 'Digital Signature Services', and 'TL Browser'). The main content area is titled 'Trusted lists' and lists the following:

- LOTL-2** <http://webgate.ec.europa.eu/esig-validation-test/tl/LOTL-2>
  - TL-21** <http://webgate.ec.europa.eu/esig-validation-test/tl/TL-21>
  - TL-22** <http://webgate.ec.europa.eu/esig-validation-test/tl/TL-22>
  - TL-23** <http://webgate.ec.europa.eu/esig-validation-test/tl/TL-23>
  - TL-24** <http://webgate.ec.europa.eu/esig-validation-test/tl/TL-24>
- LOTL-3** <http://webgate.ec.europa.eu/esig-validation-test/tl/LOTL-3>
  - TL-3** <http://webgate.ec.europa.eu/esig-validation-test/tl/TL-3>
  - TL-4** <http://webgate.ec.europa.eu/esig-validation-test/tl/TL-4>
  - TL-5** <http://webgate.ec.europa.eu/esig-validation-test/tl/TL-5>
  - TL-6** <http://webgate.ec.europa.eu/esig-validation-test/tl/TL-6>
  - TL-7** <http://webgate.ec.europa.eu/esig-validation-test/tl/TL-7>

The footer contains 'Service and Information' links for 'eSignature', 'Legal Notice', and 'Support', along with 'Follow us' social media icons for Twitter and LinkedIn.

Figure 2B: Trusted lists page – LOTLs and TLs

## 2.3. Test cases packages

On the “Test cases packages” web page, the test cases are displayed according to the structure of the *QES test cases* document [Figure 1A]. There are three levels of aggregation of test cases:

- LOTL
  - ⇒ The test cases are grouped by LOTL in order to facilitate the integration and to minimize the configuration required for running the tests.
- Category
  - Sub-category
    - ⇒ The test cases are classified in categories and sub-categories which refer to the certificates content/trust services implementation identified in the *QES test cases* document.

The *test cases packages* can be downloaded by LOTL (1) or in full (2).

**eSignature validation test cases**  
Test cases for assessing an implementation of eSignature validation, currently mainly focusing on qualified electronic signatures (and seals)

European Commission > CEF Digital > eSignature > eSignature validation test cases > Test cases

**Validation**

- Test cases packages
- Trusted lists

**Documentation**

- User guide
- QES test cases

**Useful links**

- CEF Digital
- Digital Signature Services
- TL Browser

**Test cases packages**

**LOTL-2:** [Download test cases](#) **1**

**2. Processing the TLs**

**1. None**

ID	Description	Expected result
2.1.1	TL signature is not authorized, TL is ignored	AdESig
2.1.2	TL signature crypto failure, TL is ignored	AdESig
2.1.3	TL has expired (Next Update)	QESig
2.1.4	TL is unavailable	AdESig

**LOTL-3:** [Download test cases](#)

**3. Matching SDI + Sti/aSI + status**

**1.0 matching service**

ID	Description	Expected result
3.1.1	No matching SDI	AdESig
3.1.2	No matching CA/QC	AdESig
3.1.3	No matching Sie:aSI	AdESig

**Figure 2C: Test cases page – package download**

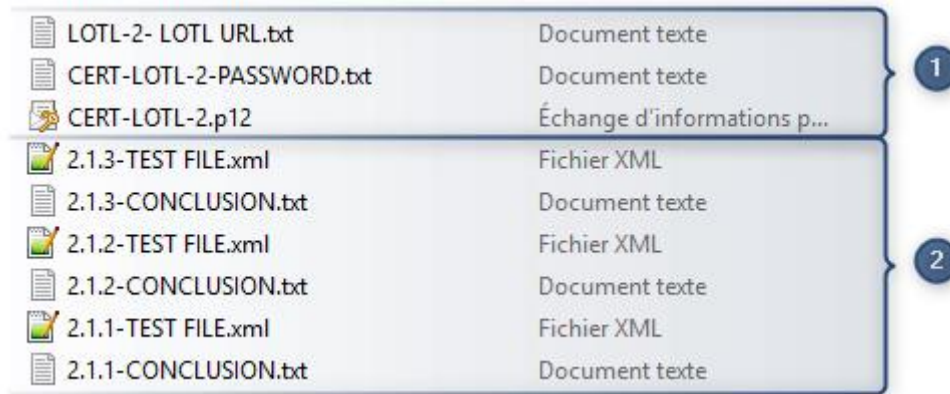
The test cases and related elements (LOTLS, TLs and LOTL-signing keystores) may expire as they contain dates (start date, notBefore date, notAfter date...). In order to avoid expiration of test cases, they are automatically renewed at the end of each week.



### 3. TEST CASES PACKAGE AND INTEGRATION

#### 3.1. LOTL test cases package

A **LOTL test cases package** include the LOTL configuration files, the *signed test files* and the QES validation conclusions, as illustrated on the following screenshot of the “LOTL-2” test cases package:



**Figure 3A: LOTL-2 Content of the package**

The filenames follow a naming convention based on %LOTL\_ID% and %TEST\_CASE\_ID%:

LOTL Configuration files names are structured as follows:

- The LOTL URL
 

Name	%LOTL_ID%- LOTL URL.txt
------	-------------------------
- The LOTL-signing keystore that contains the certificate used to sign the LOTL
 

Name	CERT-%LOTL_ID%.p12
------	--------------------
- The LOTL-signing keystore password that contains the password to read and access the keystore
 

Name	%LOTL_ID% - LOTL URL.txt
------	--------------------------

The *signed test files* and the *esig validation conclusions* filenames are structured as follows:

- The *signed test files*

Name	%TEST_CASE_ID%-TEST FILE.xml
------	------------------------------
- The *esig validation conclusions*

Name	%TEST_CASE_ID%-CONCLUSION.txt
------	-------------------------------

### 3.2. FULL test cases package

The FULL *test cases package* includes all the LOTL *test cases packages* in a unique zip file. The content of each LOTL *test cases package* is as described in the previous section.

### 3.3. Integration

As a third party, you need to:

- Download a test cases package.
- Retrieve the LOTL configuration files and configure the eSignature validation solution with them:
  - o Set the LOTL location in the eSignature validation solution to be the URL contained in the %LOTL\_ID%- LOTL URL.txt file.
  - o Set the LOTL-signing certificate in the eSignature validation solution to be the one present in the LOTL-signing keystore.
- Retrieve the list of signed test files and esig validation conclusions.
- Run the eSignature validation solution on the corresponding signed test files and compare the outcome with the expected result provided in the esig validation conclusions.

## 4. USEFUL LINKS AND CONTACTS

CEF eSignature building block: <https://ec.europa.eu/cefdigital/wiki/display/CEFDIGITAL/eSignature>

Digital Signature Service (DSS):

<https://ec.europa.eu/cefdigital/wiki/pages/viewpage.action?pageId=46992515>

Trusted list Browser (TL-Browser): <https://webgate.ec.europa.eu/tl-browser/#/>

CEF eSignature Support Team: [CEF-eSignature-support@ec.europa.eu](mailto:CEF-eSignature-support@ec.europa.eu)