



**Electronic Signatures and Infrastructures (ESI);
Testing Conformance and Interoperability of Trusted Lists;
Part 1: Specifications for testing conformance of
XML representation of Trusted Lists**

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Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Electronic Signatures and Infrastructures (ESI).

The present document is part 1 of a multi-part deliverable covering Testing Conformance and Interoperability of Trusted Lists, as identified below:

Part 1: "Specifications for testing conformance of XML representation of Trusted Lists".

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](#) (Verbal forms for the expression of provisions).

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1 Scope

The present document defines the set of checks to be performed for testing conformance of Trusted Lists as specified in ETSI TS 119 612 [1].

Checks specified by the present document are exclusively constrained to elements specified by ETSI TS 119 612 [1], certain elements defined in ETSI TS 101 903 [2], and certain elements specified in XMLSig [3].

Regarding XML elements, the present document explicitly differentiates between structural requirements that are defined by the different XML Schemas where the tested elements are defined, and the rest of the requirements specified by ETSI TS 119 612 [1].

The present document is intentionally not linked to any software development technology and is also intentionally agnostic on implementation strategies. This is one of the reasons why the test assertions set includes tests on the correctness of the structure of all the elements specified by the XML Schemas associated with ETSI TS 119 612 [1].

2 References

2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at <http://docbox.etsi.org/Reference>.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are necessary for the application of the present document.

- [1] ETSI TS 119 612 (V2.2.1): "Electronic Signatures and Infrastructures (ESI); Trusted Lists".
- [2] ETSI TS 101 903: "Electronic Signatures and Infrastructures (ESI); XML Advanced Electronic Signatures (XAdES)".
- [3] W3C Recommendation (2008): "XML-Signature Syntax and Processing (Second Edition)".
- [4] IETF RFC 2368: "The mailto URL scheme".
- [5] IETF RFC 3061: "A URN Namespace of Object Identifiers".
- [6] IETF RFC 3986: "Uniform Resource Identifier (URI): Generic Syntax".
- [7] IETF RFC 5646: "Tags for Identifying Languages".
- [8] ISO/IEC 10646:2014: "Information technology - Universal Coded Character Set (UCS)".
- [9] Recommendation ITU-T X.509: "Information technology - Open Systems Interconnection - The Directory: Public-key and attribute certificate frameworks".
- [10] FIPS Publication 180-4 (2012): "Secure Hash Standard (SHS)".

2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] OASIS: "Test Assertions Model Version 1.0".

3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

DER	Distinguished Encoding Rules
EC	European Commission
EUMS	European Union Member State
HTTP	Hyper Text Transfer Protocol
OCSP	Online Certificate Status Protocol
OID	Object IDentifier
TSP	Trusted Service Providers
URI	Uniform Resource Identifier
URN	Uniform Resource Name
XML	eXtensible Markup Language
XMLDSIG	eXtensible Markup Language Digital SIGNature

4 Overview

The present clause describes the main aspects of the technical approach used for specifying the set of tests to be performed for testing conformance of Trusted Lists against ETSI TS 119 612 [1].

Several types of tests are identified, namely:

- 1) Tests on the Trusted List structure that are directly derived from the XML Schemas associated to ETSI TS 119 612 [1]. These tests are specified in annex A.
- 2) Tests on the Trusted List structure that are not defined by the XML schemas associated to ETSI TS 119 612 [1] and that in consequence may not be tested by a XML Schema validator tool.
- 3) Tests on values of specific elements and/or attributes that cannot be tested by a XML Schema validator tool.
- 4) Tests on interrelationship between different elements present in the Trusted List (URIs that point to certain elements, for instance).
- 5) Tests on computations reflected in the contents of the Trusted Lists (digests of certain elements of some certificates, for instance).

Tests are defined as test assertions following the work produced by OASIS in "Test Assertions Model Version 1.0" [i.1].

For each Trusted List element, the present document defines a number of test assertions corresponding to the requirements specified in ETSI TS 119 612 [1].

Each test assertion includes:

- 1) Unique identifier for further referencing. The identifiers of the assertions start with a code identifying the set of requirements the assertion corresponds to, namely: "TL_EUMS".

- 2) Reference to the **Normative source** for the test.
- 3) The **Target** of the assertion. In the normative part, this field identifies ETSI TS 119 612 [1].
- 4) **Prerequisite (optional)** is, according to [i.1], "a logical expression (similar to a Predicate) which further qualifies the Target for undergoing the core test (expressed by the Predicate) that addresses the Normative Statement". It is used for building test assertions corresponding to requirements that are imposed under certain conditions.
- 5) **Predicate** fully and unambiguously defining the assertion to be tested.
- 6) **Prescription level**. Three levels are defined: mandatory, preferred and permitted, whose semantics are as specified in [i.1].
- 7) **Tag**: information on the element tested by the assertion. This indicates that Trusted Lists as specified in ETSI TS 119 612 [1] is the origin of the assertion.

Unless indicated otherwise by the name of the clause where the test assertions are defined, any test assertion applies for both European Union Member States (EUMS hereinafter) Trusted Lists and non EUMS Trusted Lists.

The present document also defines some specific test assertions for the European Commission (EC hereinafter) List of Lists.

Table 1 shows the prefixes used in the present document associated to the URIs of the corresponding namespaces.

Table 1: Prefixes used

XML Namespace URI	Prefix
http://uri.etsi.org/02231/v2#	tsl
http://uri.etsi.org/02231/v2/additionaltypes#	tslx
http://uri.etsi.org/TrstSvc/SvcInfoExt/eSigDir-1999-93-EC-TrustedList/#	sie
http://www.w3.org/2000/09/xmldsig#	ds
http://uri.etsi.org/01903/v1.3.2#	xades

5 Testing Trusted Lists

5.1 Testing auxiliary types

5.1.1 Testing multilingual string types

5.1.1.1 Testing lang attribute

TA id: TL_EUMS/MLANGSTR/1

Normative source: ETSI TS 119 612 [1], clause 5.1.4. XML Schema defined in ts_119612v020201_201601xsd.xsd.

Target: European Union Member State Trusted List.

Predicate: The value of the lang attribute is one of the values for European languages specified in IETF RFC 5646 [7] and in clause E.1 of ETSI TS 119 612 [1].

Prescription level: mandatory

Tag: EUMS Trusted List.

5.1.1.2 Testing tsl:NonEmptyString type

TA id: TL_EUMS/NEMPTYSTR/1

Normative source: ETSI TS 119 612 [1], clause 5.1.4. XML Schema defined in ts_119612v020201_201601xsd.xsd.

Target: European Union Member State Trusted List.

Predicate: The content of one instance of this type is not empty.

Prescription level: mandatory

Tag: EUMS Trusted List.

5.1.1.3 Testing `tsl:NonEmptyNormalizedString` type

For testing contents of instances of `tsl:NonEmptyStringType` the test assertions defined in clause 5.1.1.2, and the following test assertions shall apply:

TA id: TL_EUMS/NEMPTYNORMSTR/1

Normative source: ETSI TS 119 612 [1], clause 5.1.4. XML Schema defined in `ts_119612v020201_201601xsd.xsd`.

Target: European Union Member State Trusted List.

Prerequisite: Use of combining characters is needed but it is possible not to use the combining characters listed in ISO/IEC 10646 [8], clause B.1.

Predicate: The content of one instance of this type does not include any of the following whitespace characters: carriage return (`#xD`), line feed (`#A`), and tab (`#9`).

Prescription level: mandatory

Tag: EUMS Trusted List.

5.1.1.4 Testing `tsl:MultiLangStringType` type

For testing contents of instances of `tsl:MultiLangStringType` the test assertions defined in clauses 5.1.1.1 and 5.1.1.2, and the following test assertions shall apply:

TA id: TL_EUMS/MLANGSTR/1

Normative source: ETSI TS 119 612 [1], clause E.2.

Target: European Union Member State Trusted List.

Predicate: The content of one instance of this type is a string of characters from the Universal Character Set (UCS) as defined by ISO/IEC 10646 [8].

Prescription level: mandatory

Tag: EUMS Trusted List.

TA id: TL_EUMS/MLANGSTR/2

Normative source: ETSI TS 119 612 [1], clause E.2.

Target: European Union Member State Trusted List.

Predicate: The content of one instance of this type is UTF-8 encoded.

Prescription level: mandatory

Tag: EUMS Trusted List.

TA id: TL_EUMS/MLANGSTR/3

Normative source: ETSI TS 119 612 [1], clause E.2.

Target: European Union Member State Trusted List.

Predicate: The content of one instance of this type does not contain any signature to identify the UCS.

Prescription level: mandatory

Tag: EUMS Trusted List.

TA id: TL_EUMS/MLANGSTR/4

Normative source: ETSI TS 119 612 [1], clause E.2.

Target: European Union Member State Trusted List.

Predicate: The content of one instance of this type does not include private-use characters from the private use zone in the Basic Multilingual Plane and from the private-use Planes 0F and 10 in Group 00.

Prescription level: mandatory

Tag: EUMS Trusted List.

TA id: TL_EUMS/MLANGSTR/5

Normative source: ETSI TS 119 612 [1], clause E.2.

Target: European Union Member State Trusted List.

Predicate: The content of one instance of this type does not include tag characters.

Prescription level: mandatory

Tag: EUMS Trusted List.

TA id: TL_EUMS/MLANGSTR/6

Normative source: ETSI TS 119 612 [1], clause E.2.

Target: European Union Member State Trusted List.

Predicate: The content of one instance of this type is plain text without any mark-up element or tag from languages as SGML, HTML, XML, XHTML, RGF, TeX and others.

Prescription level: mandatory

Tag: EUMS Trusted List.

TA id: TL_EUMS/MLANGSTR/7

Normative source: ETSI TS 119 612 [1], clause E.2.

Target: European Union Member State Trusted List.

Predicate: The content of one instance of this type follows the semantic rules defined by the Unicode Standard for the corresponding characters.

Prescription level: preferred

Tag: EUMS Trusted List.

TA id: TL_EUMS/MLANGSTR/8
Normative source: ETSI TS 119 612 [1], clause E.2.
Target: European Union Member State Trusted List.
Prerequisite: It is possible to express the content of one instance of this type without using combining characters.
Predicate: The content does not use combining characters.
Prescription level: mandatory
Tag: EUMS Trusted List.

TA id: TL_EUMS/MLANGSTR/9
Normative source: ETSI TS 119 612 [1], clause E.2.
Target: European Union Member State Trusted List.
Prerequisite: Use of combining characters is needed but it is possible not to use the combining characters listed in ISO/IEC 10646 [8], clause B.1.
Predicate: The content of one instance of this type does not use the combining characters in ISO/IEC 10646 [8], clause B.1.
Prescription level: mandatory
Tag: EUMS Trusted List.

5.1.1.5 Testing `tsl:MultiLangNormStringType` type

For testing contents of instances of `tsl:MultiLangNormStringType`, the test assertions defined in clauses 5.1.1.3 and 5.1.1.4 shall apply.

5.1.2 Testing `tsl:InternationalNamesType` type

For testing each `tsl:Name` child element of instances of `tsl:InternationalNamesType` the test assertions defined in clause 5.1.1.5, and the following test assertions shall apply:

TA id: TL_EUMS/INTNAMES/1
Normative source: ETSI TS 119 612 [1], clause 5.1.4.
Target: European Union Member State Trusted List.
Predicate: Instances of this type contain one `tsl:Name` child element whose attribute `lang` has the value "en".
Prescription level: mandatory
Tag: EUMS Trusted List.

5.1.3 Testing `tsl:InternationalNamesType` type

For testing each `tsl:Name` child element test assertions defined in clause 5.1.1.5 shall apply.

5.1.4 Testing types for managing URIs

5.1.4.1 Testing `tsl:NonEmptyURIType` type

TA id: TL_EUMS/NEMPTYURI/1
Normative source: XML Schema defined in `ts_119612v020201_201601xsd.xsd`.
Target: European Union Member State Trusted List.
Predicate: The content of one instance of this type is not empty.
Prescription level: mandatory
Tag: EUMS Trusted List.

TA id: TL_EUMS/NEMPTYURI/2
Normative source: XML Schema defined in `ts_119612v020201_201601xsd.xsd`.
Target: European Union Member State Trusted List.
Predicate: The value of the content of one instance of this type is a valid URI Reference as specified in IETF RFC 3986 [6].
Prescription level: mandatory
Tag: EUMS Trusted List.

5.1.4.2 Testing `tsl:NonEmptyURIListType` type

For testing each `tsl:URI` child element of an instance of `tsl:NonEmptyURIListType` the test assertions of clause 5.1.4.1 shall apply.

TA id: TL_EUMS/NEMPTYURI/1

Normative source: XML Schema defined in `ts_119612v020201_201601xsd.xsd`.

Target: European Union Member State Trusted List.

Predicate: The content of one instance of this type is not empty.

Prescription level: mandatory

Tag: EUMS Trusted List.

5.1.4.3 Testing `tsl:NonEmptyMultiLangURIType` type

For testing contents of instances of `tsl:NonEmptyMultiLangURIType`, the test assertions defined in clause 5.1.4.1, and the following test assertion shall apply:

TA id: TL_EUMS/NEMPTYMLANGURI/1

Normative source: ETSI TS 119 612 [1], clause 5.1.4. XML Schema defined in `ts_119612v020201_201601xsd.xsd`.

Target: European Union Member State Trusted List.

Predicate: The value of the `lang` attribute is one of the values for European languages specified in IETF RFC 5646 [7] and in clause E.1 of ETSI TS 119 612 [1].

Prescription level: mandatory

Tag: EUMS Trusted List.

5.1.4.4 Testing `tsl:NonEmptyMultiLangURIListType` type

For each `tsl:URI` child element of one instance of this type the test assertions specified in clause 5.1.4.3 shall apply.

5.1.5 Testing Country Codes

5.1.5.1 Test assertions common to Trusted Lists from EUMS, from non EUMS, and the List of Lists from European Commission

TA id: TL_COMM/CC/1

Normative source: ETSI TS 119 612 [1], clause 5.1.5.

Target: European Union Member State Trusted List.

Predicate: The characters of a country code are capital letters.

Prescription level: mandatory

Tag: EUMS Trusted List.

TA id: TL_COMM/CC/2

Normative source: ETSI TS 119 612 [1], clause 5.1.5.

Target: European Union Member State Trusted List.

Prerequisite: The value of the country code corresponds to a country

Predicate: Valid country code values are as specified in ISO 3166-1 with exceptions as specified in test assertions TL_EUMS_CC/1 and TL_EUMS_CC_2.

Prescription level: mandatory

Tag: EUMS Trusted List.

5.1.5.2 Test assertions for non EUMS Trusted Lists

TA id: TL_NO_EUMS/CC/1

Normative source: ETSI TS 119 612 [1], clause 5.1.5.

Target: non European Union Member State Trusted List.

Prerequisite: The country code value is neither one of the codes corresponding to European Union Member States, nor "EU".

Predicate: The following are valid exceptional Country code values: commonly used extensions with regional scope, and another identifier recognised for identifying multi-state grouping.

Prescription level: mandatory

Tag: Country code value exception.

5.1.5.3 Test assertions for exceptions within EUMS Trusted Lists

TA id: TL_EUMS/CC/1

Normative source: ETSI TS 119 612 [1], clause 5.1.5.

Target: European Union Member State Trusted List.

Prerequisite: The country identified by the country code is United Kingdom

Predicate: The country code value is "UK".

Prescription level: mandatory

Tag: Country Code value exception.

TA id: TL_EUMS/CC/2

Normative source: ETSI TS 119 612 [1], clause 5.1.5.

Target: European Union Member State Trusted List.

Prerequisite: The country identified by the country code is Greece

Predicate: The country code value is "EL".

Prescription level: mandatory

Tag: Country Code value exception.

5.1.6 Testing tsl:AddressType type

5.1.6.1 Introduction

One instance of `tsl:AddressType` type is a sequence of two elements, namely `tsl:PostalAddresses` (instance of `tsl:PostalAddressListType`), and `tsl:ElectronicAddress` (instance of `tsl:ElectronicAddressType` type).

For testing one instance of `AddressType` type the test assertions defined in clauses 5.1.6.2 and 5.1.6.3 shall apply.

5.1.6.2 Testing tsl:PostalAddressListType type

One instance of `tsl:PostalAddressListType` type contains one or more `tsl:PostalAddress` children elements.

For testing each of the present `tsl:StreetAddress`, `tsl:Locality`, `tsl:StateOrProvince`, `tsl:PostalCode`, and `tsl:CountryName` children elements, the test assertions defined in clause 5.1.1.2 shall apply.

For testing the `lang` attribute the test assertions defined in clause 5.1.1.1 shall apply.

5.1.6.3 Testing tsl:ElectronicAddressType type

One instance of `tsl:ElectronicAddressType` type contains one or more `tsl:URI` children elements.

For testing each `tsl:URI` child element of instances of `tsl:ElectronicAddressType` the test assertions defined in clause 5.1.4.3 shall apply.

Furthermore the following test assertions shall apply for testing the rest of the contents of instances of `tsl:ElectronicAddressType`:

TA id: TL_EUMS/TSL/EADDR/1

Normative source: ETSI TS 119 612 [1], clause 5.3.5.2.

Target: European Union Member State Trusted List.

Predicate: One instance of `tsl:ElectronicAddressType` contains one `tsl:URI` child element containing a URI Reference identifying an e-mail address compliant with the URI scheme defined in IETF RFC 2368 [4] AND whose `lang` attribute has the value that identifies English as language.

Prescription level: mandatory

Tag: EUMS Trusted List.

TA id: TL_EUMS/TSL/EADDR/2

Normative source: ETSI TS 119 612 [1], clause 5.3.5.2.

Target: European Union Member State Trusted List.

Predicate: One instance of `tsl:ElectronicAddressType` contains one or more `tsl:URI` child element containing a URI Reference identifying an e-mail address compliant with the URI scheme defined in IETF RFC 2368 [4] AND whose `lang` attribute has a value identifying a language different to English.

Prescription level: permitted

Tag: EUMS Trusted List.