



Electronic Signatures and Infrastructures (ESI); Testing Conformance and Interoperability of Electronic Registered Delivery Services; Part 1: Testing conformance

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ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
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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 Electronic Registered Delivery Services, as identified below:

Part 1: "Testing conformance";

Part 2: "Test suites for interoperability testing of Electronic Registered Delivery Service Providers".

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 in the provision of Electronic Registered Delivery Services against the specific technical requirements defined in ETSI EN 319 522-3 [3], ETSI EN 319 522-4-1 [4] and ETSI EN 319 522-4-2 [5].

More specifically, the present document defines test assertions for testing conformance regarding:

- 1) The structure and contents of ERDS evidence as defined in ETSI EN 319 522-3 [3] (clause 6).
- 2) The structure and contents of new metadata defined in ETSI EN 319 522-3 [3] (clause 7).
- 3) The construction of AS4 ERDS messages (clause 8).
- 4) The generation of digital signatures in ERDS messages and ERDS evidence (clause 9).
- 5) Some aspects of the Common Service Interface (clause 10).
- 6) Relevant aspects of the provision of the service, namely: the generation of ERDS evidence following certain events and the security measures in the relevant interfaces defined in ETSI EN 319 522-1 [1] (clause 11).

The present document does not define test assertions for testing conformance in the provision of Electronic Registered Delivery Services against technical requirements defined outside of any of the parts of ETSI EN 319 522 [1] to [6], namely, requirements for: AS4 [15], Business Document Metadata Service Location Version 1.0 (BDXL) [17], Service Metadata Publishing (SMP) Version 1.0 (SMP) [18] and digital signatures that are defined in their respective specifications.

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 <https://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 EN 319 522-1: "Electronic Signatures and Infrastructures (ESI); Electronic Registered Delivery Services; Part 1: Framework and Architecture".
- [2] ETSI EN 319 522-2: "Electronic Signatures and Infrastructures (ESI); Electronic Registered Delivery Services; Part 2: Semantic contents".
- [3] ETSI EN 319 522-3: "Electronic Signatures and Infrastructures (ESI); Electronic Registered Delivery Services; Part 3: Formats".
- [4] ETSI EN 319 522-4-1: "Electronic Signatures and Infrastructures (ESI); Electronic Registered Delivery Services; Part 4: Bindings; Sub-part 1: Message delivery bindings".
- [5] ETSI EN 319 522-4-2: "Electronic Signatures and Infrastructures (ESI); Electronic Registered Delivery Services; Part 4: Bindings; Sub-part 2: Evidence and identification bindings".
- [6] ETSI EN 319 522-4-3: "Electronic Signatures and Infrastructures (ESI); Electronic Registered Delivery Services; Part 4: Bindings; Sub-part 3: Capability/requirements bindings".
- [7] OASIS Standard: "Test Assertions Model Version 1.0".

- [8] CEF eIDAS Technical Sub-group (Version 1.1.2 - October 2016): "eIDAS SAML Attribute profile".
- [9] ETSI TS 119 134-4: "Electronic Signatures and Infrastructures (ESI); XAdES digital signatures - Testing Conformance and Interoperability; Part 4: Testing Conformance of XAdES baseline signatures".
- [10] ETSI EN 319 132-1: "Electronic Signatures and Infrastructures (ESI); XAdES digital signatures; Part 1: Building blocks and XAdES baseline signatures".
- [11] W3C Recommendation 11 April 2013: "XML Signature Syntax and Processing Version 1.1".
- [12] IETF RFC 5035: "Enhanced Security Services (ESS) Update: Adding CertID Algorithm Agility".
- [13] W3C Recommendation 28 October 2004: "XML Schema Part 2: Datatypes Second Edition".
- [14] ETSI TS 119 134-5: "Electronic Signatures and Infrastructures (ESI); XAdES digital signatures - Testing Conformance and Interoperability; Part 5: Testing Conformance of extended XAdES signatures".
- [15] OASIS Standard (January 2013): "AS4 Profile of ebMS 3.0 Version 1.0".
- [16] ETSI TS 119 312: "Electronic Signatures and Infrastructures (ESI); Cryptographic Suites".
- [17] OASIS Standard (August 2017): "Business Document Metadata Service Location Version 1.0".
- [18] OASIS Standard (August 2017): "Service Metadata Publishing (SMP) Version 1.0".
- [19] IETF RFC 3061 (February 2001): "A URN Namespace of Object Identifiers".

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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 Standard: "Web Services Security X.509 Certificate Token Profile 1.1. OASIS Standard incorporating Approved Errata", 1 November 2006.
- [i.2] ETSI EN 319 122-1: "Electronic Signatures and Infrastructures (ESI); CAdES digital signatures; Part 1: Building blocks and CAdES baseline signatures".
- [i.3] ETSI EN 319 142-1: "Electronic Signatures and Infrastructures (ESI); PAdES digital signatures; Part 1: Building blocks and PAdES baseline signatures".
- [i.4] Regulation (EU) No 910/2014 of the European Parliament and of the Council of 23 July 2014 on electronic identification and trust services for electronic transactions in the internal market and repealing Directive 1999/93/EC.
- [i.5] ETSI TS 119 612: "Electronic Signatures and Infrastructures (ESI); Trusted Lists".

3 Definition of terms, symbols and abbreviations

3.1 Terms

For the purposes of the present document, the terms given in ETSI EN 319 522-3 [3] apply.

3.2 Symbols

Void.

3.3 Abbreviations

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

AS4	Applicability Statement 4
BDXL	Business Document Metadata Service Location
CA	Certification Authority
CSI	Common Service Interface
DNS	Domain Name Service
ERD	Electronic Registered Delivery
ERDS	Electronic Registered Delivery Service
ERDSP	Electronic Registered Delivery Service Provider
EU	European Union
HTTP	Hypertext Transfer Protocol
IETF	Internet Engineering Task Force
MEPI	Message and Evidence Push Interface
MERI	Message and Evidence Retrieval Interface
MSI	Message Submission Interface
NID	Namespace Identifier
NSS	Namespace Specific String
OASIS	Organization for the Advancement of Structured Information Standards
QERDS	Qualified Electronic Registered Delivery Service
RFC	Request for Comments
RI	Relay Interface
SAML	Security Assertion Markup Language
S-ERDS	Sender's ERDS
SMP	Service Metadata Publishing
SOAP	Simple Object Access Protocol
TA	Test Assertion
UA	User Agent
URI	Uniform Resource Identifier
URL	Universal Resource Locator
URN	Universal Resource Name
XML	eXtensible Mark-up Language

4 Overview

The present clause describes the main aspects of the technical approach used for specifying the whole set of tests to be performed for testing conformance to ERDS evidence and metadata defined in ETSI EN 319 522-3 [3].

In order to test conformance against the aforementioned specification, several types of tests are identified, namely:

- 1) Tests on the contents that are directly derived from the XML Schema referenced and copied in ETSI EN 319 522-3 [3].
- 2) Tests on the contents that are not directly derived from the XML Schema referenced and copied in ETSI EN 319 522-3 [3] 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 components.

Tests are defined as test assertions following the work produced by OASIS in "Test Assertions Model Version 1.0" [7].

For each component of the ERDS evidence and AS4 metadata defined in ETSI EN 319 522-3 [3] the present document defines a number of test assertions corresponding to the requirements specified in the aforementioned specification.

ETSI EN 319 522-3 [3] defines requirements for ERDS evidence formats and also for AS4 metadata components. For the purpose of identifying the whole set of test assertions required for testing conformance against ETSI EN 319 522-3 [3], the present document classifies the whole set of requirements specified in ETSI EN 319 522-3 [3] in the following groups.

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.
- 2) Reference to the **Normative source** for the test.
- 3) The **Target** of the assertion. In the normative part, this field identifies services whose technical implementation conforms to the requirements specified in ETSI EN 319 522 [1] to [6].
- 4) **Prerequisite (optional)** is, according to [7] "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 by tools claiming conformance to the present document.
- 6) **Prescription level:** three levels are defined: mandatory, preferred and permitted, whose semantics is to be interpreted as described in clause 3.1.2 of [7].
- 7) **Tag:** If assigned to test assertions it allows their categorization and grouping.

Table 1 shows the prefixes used to refer to specific elements in the ERDS Evidence and AS4 metadata components associated to the URIs of the corresponding namespaces.

Table 1: Prefixes used

Namespace's URI	Namespace's prefix
http://uri.etsi.org/19522/v1#	erds (or none)
http://www.w3.org/2001/XMLSchema	xs
http://www.w3.org/2000/09/xmldsig#	ds
urn:oasis:names:tc:SAML:2.0:assertion	saml

5 Test assertions for components that are used in metadata and in ERDS evidence

5.1 Introduction

The next clauses define the set of test assertions for testing conformance of components that appear in both ERDS Evidence and XML metadata against ETSI EN 319 522-3 [3].

For each component, the two first test assertions are the ones that mandate to check that the inner structure of this element matches with the content model for that element in the XML Schema, i.e.:

- 1) that it contains only the children that are allowed, and that their order and cardinalities are correct; and
- 2) that it contains only the permitted attributes.

Within the predicates for testing the inner structure of an XML element in terms of its children, the present document uses the following principles:

- 1) The order in listing the names of the children elements shall correspond with the order these children shall appear within the content of the checked element.
- 2) The description of the content model in terms of children elements uses the following special characters:
 - Children elements groups may be defined enclosing their names between round brackets ().
 - || indicate logical exclusive OR.
 - & indicates logical AND.
 - ! indicates logical NOT.
- 3) The cardinalities of each child element shall be indicated as follows:
 - Absence of indication indicates that the child element shall appear once at that position.
 - ? indicates that the child element/group of children elements may have 0 or 1 occurrences at that position.
 - * indicates that the child element/group of children elements may have 0, 1, or more than 1 occurrences at that position.
 - + indicates that the child element/group of children elements may have 1, or more than 1 occurrences at that position.

EXAMPLE 1: The third test assertion (the one with code ERDS/EVIDENCE/EVENT_REASON/TA_03) in clause 6.5 defines the following predicate for testing the XML children of the EventReason element as follows: "The content of EventReason element child of EventReasons element: Code Details?". This means that it has to be checked that:

- 1) there are 1 or 2 children;
- 2) that the first child element is always Code; and
- 3) that if there is a second element it has to be the Details child element.

EXAMPLE 2: The second test assertion (the one with code ERDS/EVIDENCE/ROOT/TA_02) in clause 6.2 defines the following predicate for testing the attributes that do not declare namespaces within the Evidence element: "The set of attributes (leaving apart the attributes declaring namespaces) of the Evidence XML element, is as follows: version Id?". This means that it has to be checked that:

- 1) there are 1 or 2 attributes (leaving apart the ones that declare namespaces);
- 2) that version attribute is present; and
- 3) that if there is another attribute it has to be the Id attribute.

5.2 Test assertions for instances auxiliary types

5.2.1 Introduction

Clause 5.2 defines test assertions for the following auxiliary types that are used in both ERDS evidence and in ERDS metadata:

- NonEmptyURIType, NonEmptyAttributedURIType;
- NonEmptyMultiLangURIType NonEmptyStringType;
- NonEmptyMultiLangURIListType; and

- AttributedNonEmptyStringType.

5.2.2 Test assertions for instances of `NonEmptyURIType` type

ERDS/NON_EMPTY_URI/TA_01	
TA Id	ERDS/NON_EMPTY_URI/TA_01
Normative source	ETSI EN 319 522-3 [3], clause 4.3.3.2
Target	Conformance to ERDS Evidence and metadata content
Predicate	Instances of <code>NonEmptyURIType</code> type do not have any XML children elements
Prescription level	Mandatory
Tag	Conformance, ERDS, ERDS Evidence

ERDS/NON_EMPTY_URI/TA_02	
TA Id	ERDS/NON_EMPTY_URI/TA_02
Normative source	ETSI EN 319 522-3 [3], clause 4.3.3.2
Target	Conformance to ERDS Evidence and metadata content
Predicate	Instances of <code>NonEmptyURIType</code> type do not have any XML attribute except the attributes declaring namespaces
Prescription level	Mandatory
Tag	Conformance, ERDS, ERDS Evidence

ERDS/NON_EMPTY_URI/TA_03	
TA Id	ERDS/NON_EMPTY_URI/TA_03
Normative source	ETSI EN 319 522-3 [3], clause 4.3.3.2
Target	Conformance to ERDS Evidence and metadata content
Predicate	The value of an instance of <code>NonEmptyURIType</code> type is a valid URI reference
Prescription level	Mandatory
Tag	Conformance, ERDS, ERDS Evidence

ERDS/NON_EMPTY_URI/TA_04	
TA Id	ERDS/NON_EMPTY_URI/TA_04
Normative source	ETSI EN 319 522-3 [3], clause 4.3.3.2
Target	Conformance to ERDS Evidence and metadata content
Predicate	The value of an instance of <code>NonEmptyURIType</code> type is not an empty string
Prescription level	Mandatory
Tag	Conformance, ERDS, ERDS Evidence

5.2.3 Test assertions for instances of `NonEmptyAttributedURIType` type

ERDS/NON_EMPTY_ATTR_URI/TA_01	
TA Id	ERDS/NON_EMPTY_ATTR_URI/TA_01
Normative source	ETSI EN 319 522-3 [3], clause 4.3.3.2
Target	Conformance to ERDS Evidence and metadata content
Predicate	Instances of <code>NonEmptyAttributedURIType</code> type do not have any XML children elements
Prescription level	Mandatory
Tag	Conformance, ERDS, ERDS Evidence

ERDS/NON_EMPTY_ATTR_URI/TA_02	
TA Id	ERDS/NON_EMPTY_ATTR_URI/TA_02
Normative source	ETSI EN 319 522-3 [3], clause 4.3.3.2
Target	Conformance to ERDS Evidence and metadata content
Predicate	The set of attributes (leaving apart the attributes declaring namespaces) of Instances of <code>NonEmptyAttributedURIType</code> type, is as follows: <code>xml:lang</code> scheme?
Prescription level	Mandatory
Tag	Conformance, ERDS, ERDS Evidence

ERDS/NON_EMPTY_ATTR_URI/TA_03	
TA Id	ERDS/NON_EMPTY_ATTR_URI/TA_03
Normative source	ETSI EN 319 522-3 [3], clause 4.3.3.2
Target	Conformance to ERDS Evidence and metadata content
Predicate	The value of an instance of NonEmptyAttributedURIType type is a valid URI reference
Prescription level	Mandatory
Tag	Conformance, ERDS, ERDS Evidence

ERDS/NON_EMPTY_ATTR_URI/TA_04	
TA Id	ERDS/NON_EMPTY_ATTR_URI/TA_04
Normative source	ETSI EN 319 522-3 [3], clause 4.3.3.2
Target	Conformance to ERDS Evidence and metadata content
Predicate	The value of an instance of NonEmptyAttributedURIType type is not an empty string
Prescription level	Mandatory
Tag	Conformance, ERDS, ERDS Evidence

5.2.4 Test assertions for instances of NonEmptyMultiLangURIType type

ERDS/NON_EMPTY_MULT_LANG_URI/TA_01	
TA Id	ERDS/NON_EMPTY_MULT_LANG_URI/TA_01
Normative source	ETSI EN 319 522-3 [3], clause 4.3.3.2
Target	Conformance to ERDS Evidence and metadata content
Predicate	Instances of NonEmptyMultiLangURIType type do not have any XML children elements
Prescription level	Mandatory
Tag	Conformance, ERDS, ERDS Evidence

ERDS/NON_EMPTY_MULT_LANG_URI/TA_02	
TA Id	ERDS/NON_EMPTY_MULT_LANG_URI/TA_02
Normative source	ETSI EN 319 522-3 [3], clause 4.3.3.2
Target	Conformance to ERDS Evidence and metadata content
Predicate	The set of attributes (leaving apart the attributes declaring namespaces) of instances of NonEmptyMultiLangURIType type, is as follows: xml:lang
Prescription level	Mandatory
Tag	Conformance, ERDS, ERDS Evidence

ERDS/NON_EMPTY_MULT_LANG_URI/TA_03	
TA Id	ERDS/NON_EMPTY_MULT_LANG_URI/TA_03
Normative source	ETSI EN 319 522-3 [3], clause 4.3.3.2
Target	Conformance to ERDS Evidence and metadata content
Predicate	The value of an instance of NonEmptyMultiLangURIType type is a valid URI reference
Prescription level	Mandatory
Tag	Conformance, ERDS, ERDS Evidence

ERDS/NON_EMPTY_MULT_LANG_URI/TA_04	
TA Id	ERDS/NON_EMPTY_MULT_LANG_URI/TA_04
Normative source	ETSI EN 319 522-3 [3], clause 4.3.3.2
Target	Conformance to ERDS Evidence and metadata content
Predicate	The value of an instance of NonEmptyMultiLangURIType type is not an empty string
Prescription level	Mandatory
Tag	Conformance, ERDS, ERDS Evidence