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**Electronic Signatures and Infrastructures (ESI);
Electronic Registered Delivery Services;
Part 2: Semantic contents**

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Foreword

This draft European Standard (EN) has been produced by ETSI Technical Committee Electronic Signatures and Infrastructures (ESI), and is now submitted for the combined Public Enquiry and Vote phase of the ETSI standards EN Approval Procedure.

The present document is part 2 of a multi-part deliverable. Full details of the entire series can be found in part 1 [1].

Proposed national transposition dates	
Date of latest announcement of this EN (doa):	3 months after ETSI publication
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	6 months after doa
Date of withdrawal of any conflicting National Standard (dow):	6 months after doa

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 specifies the semantic content that flows across the interfaces of ERD services which are specified in ETSI EN 319 522-1 [1], clause 5.

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.

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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] [IETF RFC 3061](#): "A URN Namespace of Object Identifiers".
- [3] [Core Person Vocabulary v2.0](#).
- [4] [Registered Organizations Vocabulary v2.0](#).
- [5] [CEF eIDAS Technical Sub-group](#): "eIDAS SAML Attribute profile", Version 1.2. August 2019.

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] [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.2] Void.
- [i.3] IETF RFC 4122: "A Universally Unique IDentifier (UUID) URN Namespace".
- [i.4] IETF RFC 5322: "Internet Message Format".
- [i.5] ETSI TS 119 312: "Electronic Signatures and Infrastructures (ESI); Cryptographic Suites".
- [i.6] ETSI TS 119 612: "Electronic Signatures and Infrastructures (ESI); Trusted Lists".
- [i.7] ETSI EN 319 522-3: "Electronic Signatures and Infrastructures (ESI); Electronic Registered Delivery Services; Part 3: Formats".

- [i.8] ETSI EN 319 522-4-1: "Electronic Signatures and Infrastructures (ESI); Electronic Registered Delivery Services; Part 4: Bindings; Sub-part 1: Message delivery bindings".
- [i.9] 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".
- [i.10] Void.
- [i.11] ETSI EN 319 122-1: "Electronic Signatures and Infrastructures (ESI); CAAdES digital signatures; Part 1: Building blocks and CAAdES baseline signatures".
- [i.12] ETSI EN 319 132-1: "Electronic Signatures and Infrastructures (ESI); XAdES digital signatures; Part 1: Building blocks and XAdES baseline signatures".
- [i.13] ETSI EN 319 142-1: "Electronic Signatures and Infrastructures (ESI); PAdES digital signatures; Part 1: Building blocks and PAdES baseline signatures".

3 Definition of terms, symbols and abbreviations

3.1 Terms

For the purposes of the present document, the terms given in ETSI EN 319 522-1 [1] and the following apply:

ERD dispatch: ERD message which contains the user content, some ERDS relay metadata and ERDS evidence

ERD payload: ERD message which contains the user content and some ERDS relay metadata

ERDS receipt: ERD message which contains ERDS evidence and some ERDS relay metadata

ERDS serviceinfo: ERD message which contains some ERDS relay metadata

3.2 Symbols

Void.

3.3 Abbreviations

Void.

4 Overview

The present document specifies the semantic content that flows across the interfaces which have been identified in ETSI EN 319 522-1 [1]. No requirements are introduced on the specific formats for the content; formats are specified in ETSI EN 319 522-3 [i.7].

Figure 1 outlines how data flows through the interfaces in the 4-corner model. User content shall not be changed by ERDSs. Data flowing between systems is always encrypted, as specified by the applicable binding. As detailed below, not all objects are always required.

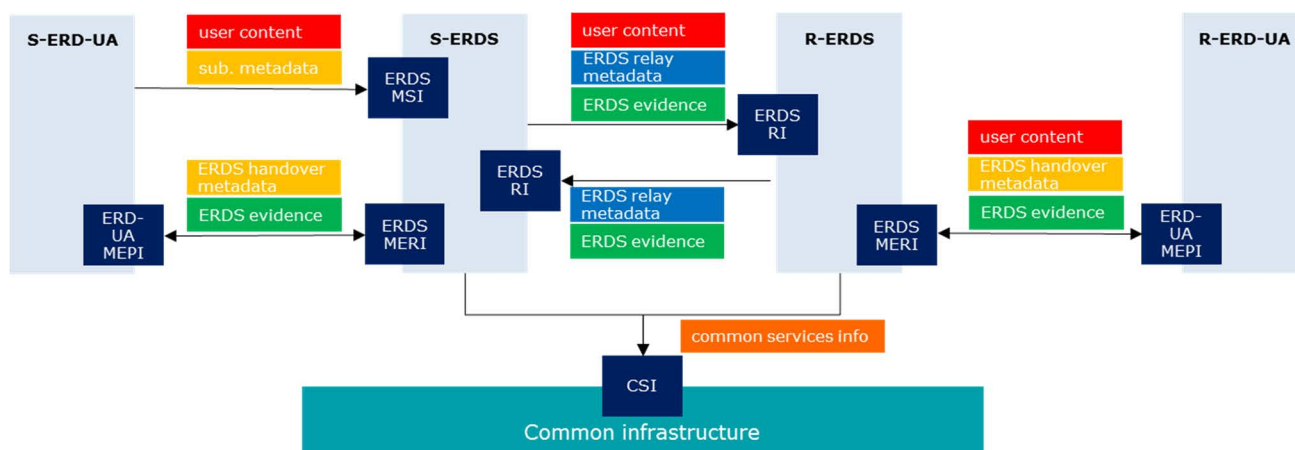


Figure 1: Data flowing through interfaces

For convenience, the present document defines (table 1) some aggregate constructs (ERD dispatch, ERDS receipt, ERDS serviceInfo, ERD payload, original message) which package the basic objects (user content, ERDS relay metadata, ERDS evidence, submission metadata) in different modes. Constructs define the semantic information flowing between parties, so they ease the definition of bindings [3] and [4], even if, specific bindings may split the construct in its basic objects for transport.

The naming convention used in the present document is that constructs whose content is completely generated by the ERDS are prefixed with "ERDS", while constructs whose content includes user generated data is prefixed with "ERD". Table 1 specifies the composition of constructs as a collection of basic objects.

Table 1: Composition of constructs

Construct	Basic object	user content	ERDS relay metadata	ERDS evidence	submission metadata
	ERD message	ERD dispatch	1	1	1..n
ERDS receipt		0	1	1..n	0
ERDS serviceInfo		0	1	0	0
ERD payload		1	1	0	0
	original message	1	0	0	0..1

NOTE: ERDS receipt (which contains ERDS relay metadata and also ERDS evidence) and ERDS serviceInfo (which only contains ERDS relay metadata) may play the role of notifications in those cases where this feature is required, and in such cases the recipient can be informed of this role by some metadata or other element.

Table 2 provides an abstract specification of the functions provided by the ERDS APIs as defined in ETSI EN 319 522-1 [1].

Table 2: Abstract interfaces

Interface	Provided function	Description	Arguments and output
ERDS MSI	out := SubmitMessage(og)	The method is used for posting an original message to the S-ERDS. In order to use the SubmitMessage API, the UA/Application has to prove that the sender is the owner of the sender's identifier (via an authentication token, a challenge response, etc.).	og: original message, composed of user content and (optional) submission metadata. out: the outcome of the method. There is no specification on the outcome, which may be a simple success/error indication, or may include a message identifier or a larger set of information.
	out :=RetrieveMessage (mi)	The method is used for retrieving a user content from the R-ERDS. Alternatively, a push of the user content to the recipient UA/application can be used through the ERD-UA MEPI interface. In order to use the RetrieveMessageAPI, the UA/Application has to prove that the recipient is the owner of the recipient's identifier (via an authentication token, a challenge response, etc.).	mi: this is a set of parameters which is used for the identification and retrieval of the requested user content. out: this is the outcome of the method, which, in case of success, includes the user content and possibly handover metadata and ERDS evidence. In case of failure the outcome will include error information.
ERDS MERI	e := GetEvidences(ei)	The method is used for retrieving one or more evidences associated to a user content which has previously been managed by the ERDS. Note that this is not the only way to obtain evidence, since an evidence can be transmitted in different ways (e.g. as an output of the SubmitMessage or the RetrieveMessage).	ei: this is a set of parameters which is used for the identification and retrieval of the requested evidence. e: the requested evidences.
	out := HandoverObjects(o)	The method is used for handing over user content, ERDS evidence, handover metadata to the ERD-UA.	o: a combination of user content [0..1], ERDS evidence [0..n], handover metadata [0..1], excluding void. out: this is the outcome of the method, which is a success/failure indication plus error information in case of failure.
ERD-UA MEPI	out := Relay(em)	The method is used for relaying an ERD message to a different ERDS. Relaying is used when S-ERDS has not the capability to deliver to the recipient itself. Metadata and evidences may be transmitted with the user content or independently from the user content through this method.	em: ERD message. out: this is the outcome of the method, which is a success/failure indication plus error information in case of failure. It may also include an evidence and ERDS relay metadata.
ERDS RI	re:= LookupERDS(ri)	This method is used to identify the ERDS which has the capability to deliver to a defined recipient. The method may return more than one ERDS.	ri: unique identification of the recipient, which may be one identifier or a set of attributes that together provides unique identification (e.g. id, domain, application protocol, etc.). re: one or more endpoints of the ERDS(s) which has(have) the capability to deliver to the recipient identified by ri.
CSI	out := ValidateERDS(ei, p)	This method may be used to validate the inclusion of an ERDS into a trust circle. The method may receive some parameters for the validation (e.g. date and time of validity, specific trust circle, etc.).	ei: a unique identifier for the ERDS. p: a set of parameters for the validation out: the outcome of the check, which may include a set of information about the ERDS from a trust perspective.
	em := GetERDSMetadata (ei)	This method is used to retrieve operational metadata about a specific ERDS.	ei: a unique identifier for the ERDS. em: a set of information about the ERDS from an operational perspective (capabilities, requirements, endpoints).

The following clauses specify the semantics of the data which are transported through the interfaces; in particular:

- Clause 5 specifies the semantics of the components required for identifying the sender and the recipient.
- Clause 6 specifies the semantics of ERDS relay metadata.
- Clause 8 specifies the semantics of ERDS Evidence.
- Clause 9 specifies the semantics of information for Common Service Interface.

5 Identification of actors

5.1 Introduction

An ERDS needs to generate, exchange and validate attributes to support the identification and authentication of end entities like sender, recipient or a delegate.

5.2 Identifiers

An identifier shall have two components: an identifying scheme name and the identifier value, which shall be coherent with the identifying scheme name. The identifier shall be unique within the network of interoperating ERDSs.

5.3 Identity attributes

5.3.1 Introduction

All attributes in the present document related to identification and authentication are derived from the EU Vocabulary. For natural persons, the attributes defined by the Core Person Vocabulary [3] shall be used, for legal persons, the attributes defined by the Registered Organization Vocabulary [4] shall be used. The Registered Organization Vocabulary defines the core vocabulary for legal persons registered through a formal process, typically in a national or regional register.

For the sake of simplicity, the present document limits the supported attributes to the ones defined in the eIDAS attribute profile specification [5], which are also attributes derived from the ISA vocabulary.

5.3.2 Identity attributes of natural persons

For legal persons, a non empty subset of the identity attributes identified in [5], clause 2.3.1 shall be used.

Table 3: Void.

5.3.3 Identity attributes of legal person

For natural persons, a non empty subset of the identity attributes identified in [5], clause 2.2.1 shall be used.

Table 4: Void.

5.3.4 Identity attributes of other entities

Identity attributes may also be provided for entities which do not correspond to natural or legal persons (e.g. applications, things). They are not specified in the current version of the present document.

5.4 Identity verification and authentication assurance levels information

This clause defines the information which is necessary to establish the level of assurance for the entities which take part in the electronic delivery process. This information shall include:

- 1) An attribute containing details of the registration and identity proofing and verification assurance level. This attribute:
 - a) shall contain one identifier of the assurance level itself. This identifier shall have a URI as value;
 - b) may also contain an identifier of the identification policy. This identifier shall have a URI as value;
 - c) may also contain details on the identification policy;
 - d) may also contain one or more URIs pointing to resources that contain details of the aforementioned policy provided in different languages.
- 2) An attribute containing details of the authentication means and mechanisms assurance level. This attribute:
 - a) shall contain one identifier of the assurance level itself. This identifier shall have a URI as value;
 - b) may also contain an identifier of the authentication policy. This identifier shall have a URI as value;
 - c) may also contain details on the authentication policy;
 - d) may also contain one or more URIs pointing to resources that contain details of the aforementioned policy provided in different languages.

Furthermore, the identity assurance information may include an attribute containing details of the performed authentication, either an assertion generated by an assertion provider or as a sequence of components, consisting of:

- the date and time when the authentication process was conducted;
- the identification of the authentication method used.

6 ERDS relay metadata

6.1 Introduction

ERDS relay metadata is produced by an ERDS and is provided to a peer ERDS. It includes a set of information for the correct processing of the user content between different actors in the delivery process. The ERDS relay metadata may be transmitted together with the user content, with some evidence, or alone as described in ETSI EN 319 522-4-1 [i.8] and ETSI EN 319 522-4-2 [i.9].

Part of ERDS relay metadata may be replicated in evidences. This is allowed, since metadata may be used for the delivery process; it is also relevant when the user content flows detached from the evidence. ERDS relay metadata shall include metadata components as indicated in the Cardinality column of table 5.

Table 5: Relay metadata components

	Component code	Component name	Cardinality	Ref.
Delivery constraints	MD01	Metadata version	1	6.2.1
	MD02	Relay date and time	0-1	6.2.2
	MD03	Expiry date and time	0-1	6.2.3
	MD04	Recipient required level of assurance	0-1	6.2.4
	MD05	Applicable policy	0-n	6.2.5
	MD06	Mode of consignment	0-1	6.2.6
	MD07	Scheduled delivery	0-1	6.2.7
Sender/	MD08	Sender's identifier	1	6.2.8