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- Part 4: Bindings - Sub-part 1: Message delivery bindings

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Foreword

This European Standard (EN) has been produced by ETSI Technical Committee Electronic Signatures and Infrastructures (ESI).

The present document is part 4, sub-part 1 of a multi-part deliverable. Full details of the entire series can be found in part 1 [i.3].

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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 binding of the ERD messages, whose semantics is defined in ETSI EN 319 522-2 [1] and whose format is defined in ETSI EN 319 522-3 [2], to the specific transmission protocol AS4 [4].

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 319 522-2: "Electronic Signatures and Infrastructures (ESI); Electronic Registered Delivery Services; Part 2: Semantic Contents".
- [2] ETSI EN 319 522-3: "Electronic Signatures and Infrastructures (ESI); Electronic Registered Delivery Services; Part 3: Formats".
- [3] ETSI TS 119 312: "Electronic Signatures and Infrastructures (ESI); Cryptographic Suites".
- [4] OASIS: "AS4 Profile of ebMS 3.0 Version 1.0", OASIS Standard, January 2013.
<https://standards.iteh.ai/catalog/standards/sist/0ed1c3e3-2761-4d53-86a2-0b466273731b/sist-en-319-522-4-1-v1-1-1-2018>
- [5] W3C Recommendation: "XML Encryption Syntax and Processing Version 1.1", 11 April 2013.
- [6] 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".
- [7] ETSI EN 319 532-3: "Electronic Signatures and Infrastructures (ESI); Registered Electronic Mail (REM) Services; Part 3: Formats".

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.

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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] IETF RFC 5322: "Internet Message Format".
- [i.2] OASIS: "Web Services Security X.509 Certificate Token Profile 1.1. OASIS Standard incorporating Approved Errata", OASIS Standard, 1 November 2006.
- [i.3] ETSI EN 319 522-1: "Electronic Signatures and Infrastructures (ESI); Electronic Registered Delivery Services; Part 1: Framework and Architecture".

[i.4] OASIS: "ebXML Messaging Services Version 3.0: Part 1, Core Features", Committee Specification, July 2007.

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in ETSI EN 319 522-1 [i.3] apply.

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in ETSI EN 319 522-1 [i.3] apply.

4 Message delivery bindings - general concepts

The present document specifies the bindings of the interface ERDS-RI to specific protocols.

The bindings shall support the exchange of ERD messages (ERD dispatch, ERD payload, ERDS receipt, ERDS serviceInfo) through the ERDS-RI interface as defined in ETSI EN 319 522-2 [1]. Specific formats for these objects defined in ETSI EN 319 522-3 [2] shall be supported.

The protocol bindings define the packaging of ERD messages into protocol specific constructs.

Clause 5 defines the mapping of the abstract constructs to AS4 [4]. Clause 6 points to a different document which defines the binding to IETF RFC 5322 [i.1].

5 AS4 binding

5.1 Introduction

This clause provides a specification for the exchange of an **ERD message** between two ERDS, i.e. the implementation of the relay operation as defined in ETSI EN 319 522-2 [1], using the AS4 message exchange protocol [4]. This binding specification consists of four clauses for each of the defined constructs in ETSI EN 319 522-2 [1], clause 4 and one clause describing the generic requirements that apply to all bindings.

The configuration of an ebMS V3/AS4 [4] message exchange is done using P-Modes, short for processing modes. A P-Mode, described in section 4 of the ebMS version 3 Core Specification [i.4], is a set of parameters each specifying a specific detail of the message exchange, e.g. the identifiers of the sender and receiver and the signing algorithm. When parties are going to set up a message exchange they need to agree on the P-Mode(s) to use.

To facilitate P-Mode creation and improve interoperability between parties, *profiles* can be created to predefine a set of values for certain P-Mode parameters. The next clauses define such a profile by defining constraints on and defaults for the values of certain P-Mode parameters to ensure interoperability of the message exchange between ERDS and to fulfil requirements put on the relay operation. Together with the meta-data mapping provided in ETSI EN 319 522-3 [2] this creates an "ERDS profile" of AS4.

NOTE: The present document does not prescribe how the actual P-Modes used in an ERDS are created, this is left to the implementations. Depending on the environment, e.g. the number of ERDS in a network and the volatility of changes, either statically or dynamically configured P-Modes may be used. For dynamic configuration the capability lookup mechanism of CSI (e.g. may be used to find the target ERDS and get the relevant meta-data for setting the P-Mode parameters).

5.2 Generic requirements

When using AS4 for the implementation of the relay operation ERDS shall conform to the *AS4 ebHandler Conformance Clause* and all related features as defined in section 6.1 of AS4 [4]. Additionally the following requirements as described in the next paragraphs and clauses apply.

Although the AS4 ebHandler Conformance Clause allows the use of two message exchange patterns, push and pull, for the relay of an **ERD message**, ERDS shall only use the push message exchange pattern.

ERD messages shall be packaged in User Messages. The user content, ERDS relay meta-data and ERDS evidence shall be included as ebMS payloads that are packaged as SOAP attachments, i.e. the SOAP Body shall not be used. The AS4 Compression Feature as defined in section 3.1 of the AS4 Profile [4] and which offers the option to compress payloads packaged in the SOAP attachments should not be used by the ERDS so the digest included in the signature of the AS4 message is calculated over the unmodified user content. If compression is needed ERDS may use the HTTP gzip transfer-encoding.

Each payload contained in the AS4 message shall have a part property, i.e. a `//PartInfo/Property` element shall be included in the message header that indicates the object type of the payload. The name of the property shall be `http://uri.etsi.org/19522/v1#as4binding/PayloadType` and the value shall be set according to table 1.

Table 1: Part property values

Object type	Value for part property
User Content	<i>UserContent</i>
ERDS Relay metadata	<i>ERDSRelayMetadata</i>
ERDS Evidence	<i>ERDSEvidence</i>

Since the ERDS Relay metadata is always included the AS4 message shall always include at least one payload containing the XML representation of the metadata as specified in clause 4 of ETSI EN 319 522-3 [2].

The PMode.Initiator and PMode.Responder parameters shall include the identifiers of the sending and receiving ERDSs respectively. Both the PMode.Initiator.Role and PMode.Responder.Role shall contain the value `http://uri.etsi.org/19522/v1#as4binding/Roles/ERDS`.

PMode[1].BusinessInfo.Service shall be set to `http://uri.etsi.org/19522/v1#as4binding/Relay`. The Service type shall not be used.

Signed Receipts shall be used to indicate the AS4 message was successfully sent by the receiving ERDS and the ERD message is ready for further processing, i.e. both PMode[1].Security.SendReceipt shall PMode[1].Security.SendReceipt.NonRepudiation have value true.

NOTE 1: This only indicates that the exchange of the ERD message was successful but provides no information on the actual consignment/handover of the user content to the final recipient.

Both the Receipt and Error Signal messages shall be sent back synchronously to the sending ERDS, i.e. PMode[1].Security.SendReceipt.ReplyPattern and PMode[1].ErrorHandling.Report.AsResponse shall have value true.

The AS4 Reception Awareness Feature as specified in section 3.2 of the AS4 specification [4] should be used. ERDS should use the duplicate elimination function to prevent redundant delivery of the same message to the user application.

NOTE 2: Using duplicate elimination on the AS4 exchange does not guarantee that the same ERD Message is only delivered once to the user application as the same message may be submitted multiple times by the sending user application (resulting in multiple AS4 messages).

5.3 Signing and encryption of the AS4 message

All AS4 messages exchanged between the ERDS shall be signed and encrypted by the sending ERDS. Table 2 shows the settings that shall be used for signing and encryption of the AS4 message. As AS4 uses XML Encryption Syntax and Processing [5] for message encryption the algorithms identifiers from this specification are used in table 2.