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Ships and marine technology — Electronic port clearance (EPC) —

Part 1: Message structures and application programming interfaces

Navires et technologie maritime — Opérations portuaires assistées par systèmes électroniques —

Partie 1: Structures des messages et interfaces de programmation des applications

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 8, *Ships and marine technology*, Subcommittee SC 11, *Intermodal and short sea shipping.*

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This second edition cancels and replaces the first edition (ISO 28005-1:2013), which has been technically revised.

The main changes are as follows:

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- a general introduction to all documents in the ISO 28005 series, including the structure of XML and XSD files and general XML type definitions, has been added in Clauses 4 to 6;
- Clause 7 defining the general design principles for the ISO 28005 series has been added;
- Clause 8 has added general message exchange patterns that can be referenced in message implementation guides;
- Clause 9 has added a more general multi-part message structure based on the HTTP multi-part form structure. This includes a formalization of how attachments to the XML based message body can be added to the message. It also includes possibilities for using EDIFACT or JSON as a message body or as attachments to the standardized XML message body or adding encrypted message parts as attachments (detailed in Clauses 11 and 12);
- the message header has been updated so that it contains sufficient information to do frontend message processing before forwarding the message to the service specific software modules (see Clause 10);
- support for digital signatures has been added in Clause 13. Digital signature certificates can be attached to a message (see Clause 14);
- a definition of a HTTP-based transport protocol has been added in Clauses 15 to 17;
- a possibility for access authorization has been added in Clause 18;
- a definition for the structure of message implementation guides has been added in Clause 19;

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— message implementation guides for access authorization have been added in Annex B, and a maritime single window and mandatory reporting systems have been added in Annex C.

A list of all parts in the ISO 28005 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

This document contains technical specifications that facilitate an efficient exchange of electronic information between ships and shore parties for coastal transit or port calls. It defines the general message format, general message exchange patterns and a message transfer protocol. Other parts of the ISO 28005 series define data models for various types of message transfers.

The message transfer protocol specified in this document uses HTTP over TLS. While many HTTP type application program interfaces (API) are built on the representational state transfer (REST) principle, this document does not use REST. APIs developed according to this document can support physical services such as ordering tugs or pilots, where state changes cannot be guaranteed to be compliant with REST.

This document can be used as a specification of a message format that can be transmitted over other transport protocols than the one defined in this document.

This document is aligned with the IMO FAL guidelines on authentication, integrity and confidentiality in information exchanges via maritime single windows and related services (IMO FAL.5/Circ.46)[1] and the IMO FAL guidelines for harmonized communication and electronic exchange of operational data for port calls, 31 March 2023 (IMO FAL.5/Circ.52).[2] The specifications in this document are aligned with the requirements in ISO 23807.[3]

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Ships and marine technology — Electronic port clearance (EPC) —

Part 1: Message structures and application programming interfaces

1 Scope

This document defines the principles, methods and requirements for message exchanges between ships, ship representatives, and other shore parties via a peer-to-peer communication system. This document defines the message structure, including how the data content is assembled from other parts of the ISO 28005 series, and how digital signatures for authentication, integrity, and confidentiality of the message can be used. It also specifies a transport protocol, the basic message exchange patterns, and the protocol related roles of each party in the message exchange. Furthermore, it specifies how more specific message implementation guides (MIGs) are provided for each type of communication application.

2 Normative references

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The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3166-1, *Codes for the representation of names of countries and their subdivisions — Part 1: Country code*

ISO 3166-2, *Codes for the representation of names of countries and their subdivisions — Part 2: Country subdivision code*

ISO 6709, *Standard representation of geographic point location by coordinates*

RFC 1952, *GZIP file format specification version 4.3*

RFC 3986, *Uniform resource identifier (URI): Generic syntax.*

RFC 5246, *The transport layer security (TLS) protocol version 1.2*

RFC 7578, *Returning values from forms: multipart/form-data*

RFC 8446, *The transport layer security (TLS) Protocol Version 1.3*

UN/EDIFACT code list 3035 – Party function code qualifier, Release D.00A, https://service.unece.org/trade/untdid/d00a/tred/tred3035.htm

UN/EDIFACT code list 3139 - Contact function code, Release D.23A, https://service.unece.org/trade/untdid/latest/tred/tred3139.htm

3 Terms, definitions, and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1.1
HTTP
hypertext transfer protocol
client/server communication protocol used to transfer information in the World Wide Web

Note 1 to entry: HTTP is defined in RFC 2068[4] as a generic and stateless application-level protocol for distributed and collaborative, information systems.

Note 2 to entry: In this document, the term HTTP is used to mean HTTP implemented over *transport layer security* (3.1.2), i.e. *HTTPS* (3.1.3), unless otherwise specified.

3.1.2
TLS
transport layer security
protocol for secure communication over the internet

Note 1 to entry: TLS is defined in RFC 5246 (Version 1.2) and RFC 8446 (Version 1.3).

3.1.3
HTTPS
hypertext transfer protocol secure
HTTP (3.1.1) over *transport layer security (TLS)* (3.1.2)

Note 1 to entry: HTTPS is an extension of HTTP used for secure communication and is defined in RFC 2818.[6] It uses TLS to encrypt the communication.

Note 2 to entry: In this document, the term HTTP is used to mean HTTP implemented over TLS, i.e. HTTPS, unless otherwise specified.

3.1.4
PKI
public key infrastructure
set of hardware, software, people, policies and procedures needed to create, manage, distribute, use, store and revoke digital certificates and manage public-key encryption

[SOURCE: ISO 20415:2019, 3.14]

3.1.5
digital signature
data appended to, or cryptographic transformation of, a data unit that allows a recipient of the data unit to prove the source and integrity of the unit and protect against forgery by, for example, the recipient

[SOURCE: ISO 20415:2019, 3.5]

3.1.6
API
application programming interface
collection of communication methods and associated parameters used by a *client* (3.1.11) to exchange information with a *server* (3.1.12)

Note 1 to entry: In this document, the term API is used in the meaning of one specific arrow in the sequence diagram (see Figure 2). Thus, a session will normally require the use of several APIs. This document describes one general *API access point* (3.1.17) that can be used by all APIs by changing the number of message components as well as the contents of one or more message parts.

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