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Information technologies — JPEG systems —

Part 4: Privacy and security



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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

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 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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents) or the IEC list of patent declarations received (see http://patents.iec.ch).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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 Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information*.

A list of all parts in the ISO/IEC 19566 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 contributes to the specification of system-level functionalities. In particular, it specifies functionalities to provide a degree of trust while sharing image content and metadata, which simultaneously also allow the signalling of the associated access policies.

A huge number of images are distributed over the internet on a daily basis. For social media alone, this already accounts for over 3 billion pictures. These photos are often shared with many people without protection for personal information or access control. In addition, many portable devices have communication functionality that allows for the immediate distribution of photos after capturing them. In combination with the potential inclusion of GPS information in the file format, for example, the photo might expose private and geo-location information to the world.

In order to avoid such undesirable situations, the framework in this document provides protection mechanisms to the JPEG family of standards. For instance, encryption can be used to protect image data

The particular focus of this document is to provide codestream and file format syntax support to enable security and privacy functionality for JPEG standards, not only in support of ISO/IEC 10918-1, but also for standards such as ISO/IEC 15444 and ISO/IEC 18477.

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Information technologies — JPEG systems —

Part 4:
Privacy and security

1 Scope

This document specifies privacy and security features which contribute to a system layer for JPEG standards. It defines generic structures that can be applied in all JPEG box-based file formats. In particular, this document specifies a signalling syntax supporting privacy and security features. The framework in this document is backwards-compatible with existing JPEG standards.

2 Normative references

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.

ITU-T T.81 | ISO/IEC 10918-1, *Information technology — Digital compression and coding of continuous-tone still images: Requirements and guidelines*

ISO/IEC 18477-3, *Information technology — Scalable compression and coding of continuous-tone still images box file format*

ISO/IEC 10646, *Information technology — Universal coded character set (UCS)*

ISO/IEC 18033-3, *Information technology — Security techniques — Encryption algorithms — Part 3: Block ciphers*

ISO/IEC 19566-5, *Information technology — JPEG systems — Part 5: JPEG universal metadata box format*

3 Terms and definitions

3.1 Definitions

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

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

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

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

3.1.1
box
binary structure that encapsulates an object embedded in a file

[SOURCE: ISO/IEC 19566-5:2019, 3.1.1]

3.1.2
codestream
sequence of bits representing a compressed image and associated metadata

[SOURCE: ISO/IEC 19566-5:2019, 3.1.2]

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3.1.3
decrypted content
resulting data after applying the signalled decryption process on the encrypted content

3.1.4
master image
image file in which the *box* (3.1.1) is embedded

3.1.5
JPEG-1 image
image encoded in JPEG file format

Note 1 to entry: The image shall be encoded in compliance to ISO/IEC 10918-1.

3.1.6
box-based file format
file format whose composing elements are boxes containing structured data in compliance with ISO-based media file format

3.1.7
JPEG XT image
image encoded in the JPEG XT file format

Note 1 to entry: the images shall be encoded in compliance to ISO/IEC 18477.

3.1.8
Replacement Data box
sequence of *boxes* (3.1.1) of any type embedded in a JUMBF Replacement box

3.2 Abbreviated terms

JPEG	joint photographic experts group
JUMBF	JPEG universal metadata box format
P&S	privacy and security
ROI	region of interest
TOG	toggles

4 Conventions

4.1 Conformance language

In this document, the following verbal forms are used:

— “shall” indicates a requirement;

— “should” indicates a recommendation;

— “may” indicates a permission;

— “can” indicates a possibility or a capability.

Information marked as “NOTE” is intended to assist the understanding or use of the document. “Notes to entry” used in Clause 3 provide additional information that supplements the terminological data and can contain provisions relating to the use of a term.

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