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Part 2: File format

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Contents

Scope	5
Normative references	5
Terms and definitions	5
General	7
File organization	7
Data types and numerical values	9
Graphical descriptions (informative)	10
Binary format of a box	10
Box Types	11
9.1 JPEG XL Signature box	11
9.2 File Type box	11
9.3 JUMBF box	11
9.4 Exif box	12
9.5 XML box	12
9.6 Compressed XML box	12
9.7 Frame Index box	12
9.8 JPEG XL Codestream box	14
9.9 JPEG XL Partial Codestream box	14
Annex A	14

Foreword

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This document was prepared by 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 18181 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.

Introduction

This document is part of a series of standards denoted JPEG XL. This document describes JPEG XL Part 2 (ISO/IEC 18181-2), the Transport and Container formats for JPEG XL codestreams as specified in ISO/IEC 18181-1. This provides a way to add metadata and extensions to JPEG XL codestreams. A file as described by this document is called a JPEG XL file.

Information Technology — JPEG XL Image Coding System — Part 2: File format

1 Scope

This document is part of a series of standards denoted JPEG XL. This document describes JPEG XL Part 2 (ISO/IEC 18181-2), the Transport and Container formats for JPEG XL codestreams as specified in ISO/IEC 18181-1. This provides a way to add metadata and extensions to JPEG XL codestreams. A file as described by this document is called a JPEG XL file.

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.

ISO/IEC 18181-1, *Information technology — JPEG XL Image Coding System — Part 1: Core coding system*
ISO/IEC DIS 18181-2
<https://standards.iso.org/standards/std/18181-2>
 5434f7e5b0d2/iso-iec-dis-18181-2

ISO/IEC 19566-5, *Information technologies — JPEG systems — Part 5: JPEG universal metadata box format (JUMBF)*

ISO/IEC 21122-3, *Information technology — JPEG XS low-latency lightweight image coding system — Part 3: Transport and container formats*

ISO/IEC 15444-2, *Information technology — JPEG 2000 image coding system: Extensions — Part 2*

ISO/IEC 23008-12, *Information technology — High efficiency coding and media delivery in heterogeneous environments — Part 12: Image File Format*

INTERNET ENGINEERING TASK FORCE (IETF). RFC 7932: *Brotli Compressed Data Format* [online]. Edited by J. Alakuijala and Z. Szabadka. July 2016 [viewed 2020-04-29]. Available at <https://tools.ietf.org/html/rfc7932>

3 Terms and definitions

For the purposes of this document, the terms and definitions given in JPEG XL Part 1 (ISO/IEC 18181-1), ISO/IEC 19566-5 and the following apply.

3.1

box

structured collection of data describing the image or the image decoding process

3.2

box content

data wrapped within the box structure

3.3

box type

kind of information stored within the box

3.4

byte

8 consecutive bits encoding a value between 0 and 255

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3.5

codestream

JPEG XL codestream as specified in ISO/IEC 18181-1

<https://standards.iteh.ai/catalog/standards/sist/c106fc96-4e43-4e72-845f-510c71e0d181-1/iso-18181-2>

3.6

file format

set of data structures for the storage of metadata and extensions of a codestream as defined by this document

3.7

JPEG XL file

data file encoded in the file format defined by this document

3.8

superbox

box that carries other boxes as payload data

4 General

This document defines the file format of a JPEG XL file.

A JPEG XL file shall contain a codestream as specified in ISO/IEC 18181-1, and may contain additional metadata and extensions.

A JPEG XL file shall come in one of the following forms:

- A box structure, as defined in Clause 5.
- A direct JPEG XL codestream without box structure

The rest of this document only defines the box structure, the codestream without box structure is valid but is completely specified in ISO/IEC 18181-1.

A decoder shall require the file format to follow either the structure of a codestream without box structure, or follow the box structure as defined in Clause 5 and follow all box requirements in the succeeding Clauses. A decoder can extract the codestream from the box structure and decode the image from the codestream using the procedure specified in ISO/IEC 18181-1, and can decode the contents of other boxes following their respective specifications in this document.

[ISO/IEC DIS 18181-2](https://standards.iteh.ai/catalog/standards/sist/c106fc96-4e43-4e72-845f-)

<https://standards.iteh.ai/catalog/standards/sist/c106fc96-4e43-4e72-845f->

INFORMATIVE NOTE A direct JPEG XL codestream without box structure is also a valid JPEG XL file. This allows, for example, a more efficient encoding of images for the web, in cases where information encoded in other boxes than the codestream is not required.

5 File organization

A JPEG XL file using the box structure is formed as a series of boxes. These boxes contain all data within the file, including the initial signature required by the file format. This box-based file format is based on the same syntax as described in the specification ISO/IEC 15444-1, Annex I or ISO/IEC 15444-2, Annex M. The binary format of a box is also described in subclause A.2 of this document. Boxes of different types contain different types of data, such as the file signature, metadata, and the codestream. Further clauses in this document define box types that may appear in a JPEG XL file and their requirements. Boxes with an unrecognized type shall be ignored and skipped by the decoder.

A JPEG XL file shall contain a JPEG XL codestream. The codestream can be split across multiple boxes: JPEG XL partial codestream boxes. In this case, the codestream is formed by the concatenation of the content of all those boxes.

Any boxes, content and codestreams present in a superbox, such as another JPEG XL file in a JUMBF superbox, shall not be taken into account for the syntactic requirements of this document; they recursively follow their applicable specification.

Figures 5.1 and 5.2 each show a conceptual box structure of a JPEG XL file, that is a possible series of different box types that form the file, respectively with a single full codestream box and with multiple partial codestream boxes. Boxes that may appear multiple times are indicated with '...' and optional boxes are indicated in a dashed rectangle. These figures are only an indication and do not imply any ordering or counting requirements for the boxes.

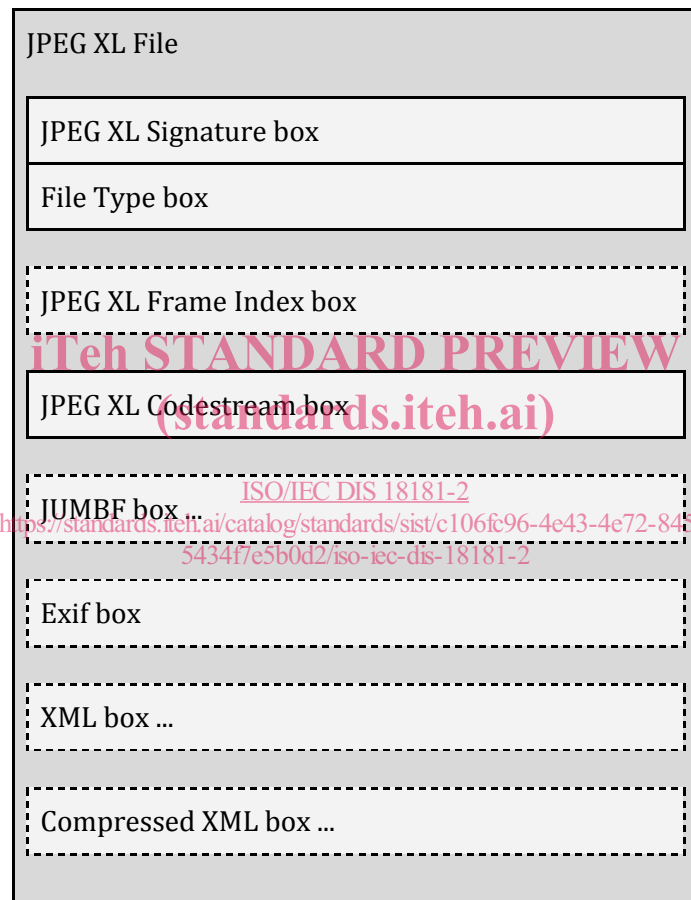


Figure 5.1 — Conceptual structure of a JPEG XL file using a full codestream box

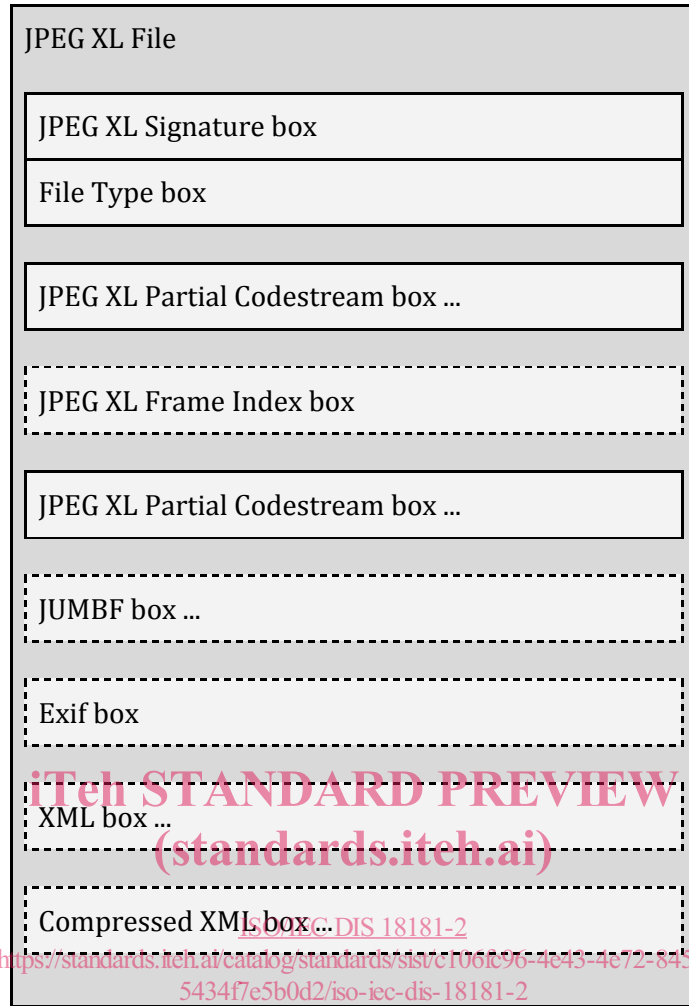


Figure 5.2 — Conceptual structure of a JPEG XL file using partial codestream boxes

NOTE 1 The fact that a decoder will accept a ISO/IEC 18181-1 codestream without boxes does not imply permission to strip boxes from the box-based file format.

NOTE 2 The decoder shall not make any assumptions about the ordering of any boxes after the first two, except where indicated.

NOTE 3 Individual boxes (Exif boxes, XML boxes, ...) may be nested within JUMBF boxes.

6 Data types and numerical values

Data types used in this document shall be interpreted by the decoder as follows:

- u32: a 32-bit unsigned integer encoded in big endian order (4 bytes).
- u64: a 64-bit unsigned integer encoded in big endian order (8 bytes).
- Varint(): an unsigned integer value of up to 63 bits as a variable length integer in little endian order as specified in ISO/IEC 18181-1:2020 in subclause 9.2.1.5.