
**Information technology — JPEG
Systems —**

**Part 1:
Packaging of information using
codestreams and file formats**

Technologies de l'information — Systèmes JPEG —

*Partie 1: Emballage des informations utilisant les flux de codes et les
formats de fichier*

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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. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

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).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/IEC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information*.

Introduction

This part of ISO/TR 19566 provides an overview for users of ISO/IEC standards in the use of common JPEG syntax elements at the systems layer for current and future International Standards developed by ISO/IEC.

With the development of coding technologies, ISO/IEC has defined a number of different file formats and multiple variants of codestream syntax. Many of these are specialized to dedicated use cases or compression algorithms. Consequently, it is difficult to maintain an overview about existing file formats, their capabilities and their architectures.

This part of ISO/TR 19566 aims to describe common architectural concepts for file formats and codestream formats. By these means, it lays out guidelines for future file formats and codestream syntax. By observing these guidelines, future International Standards may fit into an overall operable Systems infrastructure that can handle all tools standardized by the ISO/IEC body.

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Information technology — JPEG Systems —

Part 1:

Packaging of information using codestreams and file formats

1 Scope

This part of ISO/TR 19566 describes common elements of a system layer for JPEG standards, referred to as JPEG Systems.

This part of ISO/TR 19566 describes the common architecture of file formats and codestream formats used in JPEG standards. It is intended that all future Systems components support codestreams and file formats following these guidelines.

2 Terms, definitions, abbreviated terms and symbols

2.1 Terms and definitions

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

2.1.1

backward compatibility

inclusive of the old specification within the new specification

Note 1 to entry: Any devices implementing the new standard can also interpret all data compliant with the old version of the standard. However, an old device only compliant with the old version of the standard might not be able to interpret the data compliant with the new version of the standard.

2.1.2

bit stream

partially encoded or decoded sequence of bits comprising an entropy-coded segment

2.1.3

box

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

Note 1 to entry: See B.2 for the definition of boxes.

2.1.4

box-based file format

file format whose composing elements are well-defined, hierarchically structured boxes

2.1.5

byte

group of 8 bits

2.1.6

coder

embodiment of a coding process

2.1.7

coding

umbrella term that defines both the encoding/compression of a signal as well as the decoding/decompression of a signal

2.1.8

coding model

procedure used to convert input data into symbols to be coded

2.1.9

coding process

process which transforms compressed data into a continuous-tone image and/or a continuous-tone image into its compressed representation

Note 1 to entry: It presents thus an umbrella term for “encoding process” and “decoding process”.

2.1.10

compression

reduction in the number of bits used to represent source image data

2.1.11

component

two-dimensional array of samples having the same designation in the output or display device

Note 1 to entry: An image typically consists of several components, for example, red, green and blue.

2.1.12

continuous-tone image

image whose components have more than one bit per sample

2.1.13

decoder

embodiment of a decoding process

3.1.14

decoding process

process which takes as its input compressed image data and outputs a continuous-tone image

2.1.15

dequantization

inverse procedure to quantization by which the decoder recovers a representation of the DCT coefficients

2.1.16

downsampling

procedure by which the spatial resolution of a component is reduced

2.1.17

encoder

embodiment of an encoding process

2.1.18

encoding process

process which takes as its input a continuous-tone image and outputs compressed image data

2.1.19

entropy-coded (data) segment

independently decodable sequence of entropy encoded bytes of compressed image data

2.1.20

entropy decoder

embodiment of an entropy decoding procedure

2.1.21**entropy decoding**

lossless procedure which recovers the sequence of symbols from the sequence of bits produced by the entropy encoder

2.1.22**entropy encoder**

embodiment of an entropy encoding procedure

2.1.23**entropy encoding**

lossless procedure which converts a sequence of input symbols into a sequence of bits such that the average number of bits per symbol approaches the entropy of the input symbols

2.1.24**forward compatibility**

only compliant with the old specification but able to interpret the new specification

Note 1 to entry: Although devices only compliant with the old version of the standard are nevertheless able to interpret the data conforming with the new standard, it is possible that the obtained results are not as good as when using a device compliant with the new version of the standard.

2.1.25**grayscale image**

continuous-tone image that has only one component

2.1.26**high dynamic range**

image or image data comprised of more than eight bits per sample, coded in floating point representation

2.1.27**intermediate dynamic range**

image or image data comprised of more than eight bits per sample

2.1.28**Joint Photographic Experts Group****JPEG**

informal name of the committee which created this part of ISO/TR 19566

2.1.29**JPEG standards**

collection of ISO/IEC/ITU standards developed by the Joint Photographic Experts Group for still imaging application as listed in the Bibliography

2.1.30**JPEG Systems**

common elements of a system layer for JPEG standards

2.1.31**lossless**

descriptive term for encoding and decoding processes and procedures in which the output of the decoding procedure(s) is identical to the input to the encoding procedure(s)

2.1.32**lossless coding**

mode of operation which refers to any one of the coding processes defined in this part of ISO/TR 19566 in which all of the procedures are lossless

2.1.33**lossy**

descriptive term for encoding and decoding processes which are not lossless