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Information technology — Coding of audio-visual objects — Part 15: Carriage of network abstraction layer (NAL) unit structured video in the ISO base media file format (ISO/IEC 14496-15:2019)

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**Information technology — Coding of
audio-visual objects —**

**Part 15:
Carriage of network abstraction layer
(NAL) unit structured video in the ISO
base media file format**

Technologies de l'information — Codage des objets audiovisuels —

*Partie 15: Transport de vidéo structurée en unités NAL sur la couche
réseau au format ISO de base pour les fichiers médias*



ISO/IEC 14496-15:2019(E)



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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*.

This fifth edition cancels and replaces the fourth edition (ISO/IEC 14496-15:2017), which has been technically revised. It also incorporates Amendments ISO/IEC 14496-15:2017/Amd.1:2018 and ISO/IEC 14496-15:2017/Amd.2:2019.

The main changes compared to the previous edition are as follows:

- additional content incorporated as subclauses [4.11](#), [4.12](#), [9.6.4](#), [D.4.3](#), [D.4.4](#) and [D.4.5](#) and [Annex F](#);
- corrections in [Tables 2](#), [3](#) and [6](#) and subclause [A.1](#);
- deletion of subclause 5.4.10;
- minor editorial changes to align the document with the drafting rules in ISO/IEC Directives Part 2.

A list of all parts in the ISO/IEC 14496 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 defines a storage format based on, and compatible with, the ISO base media file format (ISO/IEC 14496-12), which is used by the MP4 file format (ISO/IEC 14496-14) and the motion JPEG 2000 file format (ISO/IEC 15444-3) among others. This document enables video streams formatted as network adaptation layer units (NAL units) to

- a) be used in conjunction with other media streams, such as audio,
- b) be used in an MPEG-4 systems environment, if desired,
- c) be formatted for delivery by a streaming server, using hint tracks, and
- d) inherit all the use cases and features of the ISO base media file format on which MP4 and MJ2 are based.

This document can be used as a standalone specification; it specifies how NAL unit structured video content is stored in an ISO base media file format compliant format. However, it is normally used in the context of a specification, such as the MP4 file format, derived from the ISO base media file format, that permits the use of NAL unit structured video such as AVC (ISO/IEC 14496-10) video and high efficiency video coding (HEVC, ISO/IEC 23008-2) video.

The ISO base media file format is becoming increasingly common as a general-purpose media container format for the exchange of digital media, and its use in this context should accelerate both adoption and interoperability.

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Information technology — Coding of audio-visual objects —

Part 15: Carriage of network abstraction layer (NAL) unit structured video in the ISO base media file format

1 Scope

This document specifies the storage format for streams of video that is structured as NAL units, such as AVC (ISO/IEC 14496-10) and HEVC (ISO/IEC 23008-2) video streams.

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 14496-10:2014, *Information technology — Coding of audio-visual objects — Part 10: Advanced Video Coding*

ISO/IEC 14496-12:2015, *Information technology — Coding of audio-visual objects — Part 12: ISO base media file format*

ISO/IEC 23008-2:2017, *Information technology — High efficiency coding and media delivery in heterogeneous environments — Part 2: High efficiency video coding*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 14496-10, ISO/IEC 23008-2 and the following apply.

3.1.1

3D-AVC NAL unit

3D-AVC VCL NAL unit

NAL unit with type 21 with `avc_3d_extension_flag` equal to 1

Note 1 to entry: As specified in ISO/IEC 14496-10:2014, Annex J.

3.1.2

aggregator

in-stream structure ([3.1.11](#)) using a NAL unit header for grouping of NAL units belonging to the same sample

3.1.3

AVC base layer

maximum subset of a bitstream that is AVC compatible

Note 1 to entry: This can also be expressed as a bitstream not using any of the functionality of ISO/IEC 14496-10:2014 Annex G, Annex H, Annex I, or Annex J.