INTERNATIONAL STANDARD

ISO/IEC 14496-14

Third edition
2020-01

Information technology — Coding of audio-visual objects —

Part 14: MP4 file format

Technologies de l'information — Codage des objets audiovisuels — Partie 14: Format de fichier MP4

Reference number
ISO/IEC 14496-14:2020(E)

© ISO/IEC 2020

COPYRIGHT PROTECTED DOCUMENT

© ISO/IEC 2020

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword ... **iv**
Introduction ... **v**
1 Scope ... **1**
2 Normative references ... **1**
3 Terms and definitions ... **1**
4 Storage of MPEG-4 ... **1**
4.1 Elementary stream tracks ... 1
4.1.1 Elementary stream data ... 1
4.1.2 Elementary stream descriptors ... 2
4.1.3 Object descriptors ... 2
4.2 Track identifiers ... 3
4.3 Synchronization of streams ... 4
4.4 Composition ... 5
4.5 Handling of M4Mux ... 5
5 File identification ... **6**
6 Additions to the Base Media Format ... **6**
6.1 General ... 6
6.2 Object Descriptor Box ... 7
6.2.1 Description ... 7
6.2.2 Syntax ... 7
6.2.3 Semantics ... 7
6.3 Track reference types ... 7
6.4 Track header box ... 8
6.5 Handler reference types ... 8
6.6 MPEG-4 media header boxes ... 8
6.6.1 General ... 8
6.6.2 Syntax ... 8
6.6.3 Semantics ... 8
6.7 Sample description boxes ... 9
6.7.1 Description ... 9
6.7.2 Syntax ... 10
6.7.3 Semantics ... 10
6.8 Degradation priority values ... 10
7 Template fields used ... **11**
Annex A (informative) **Handling of audio timestamps and profile/level indication** ... **12**
Bibliography ... **13**

© ISO/IEC 2020 – All rights reserved

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

This third edition cancels and replaces the second edition (ISO/IEC 14496-14:2018), of which it constitutes a minor revision. The changes compared to the previous edition are contained in Annex A and the Bibliography.

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.

© ISO/IEC 2020 – All rights reserved

Introduction

This document defines MP4 as an instance of the ISO Media File format (ISO/IEC 14496-12).

The general nature of the ISO Media File format is fully exercised by MP4. MPEG-4 presentations can be highly dynamic, and there is an infrastructure — the Object Descriptor Framework —, which serves to manage the objects and streams in a presentation. An Initial Object Descriptor serves as the starting point for this framework. In the usage modes documented in the ISO Media File, an Initial Object Descriptor would normally be present, as shown in Figures 1 to 3.

Figure 1 gives an example of a simple interchange file, containing two streams.

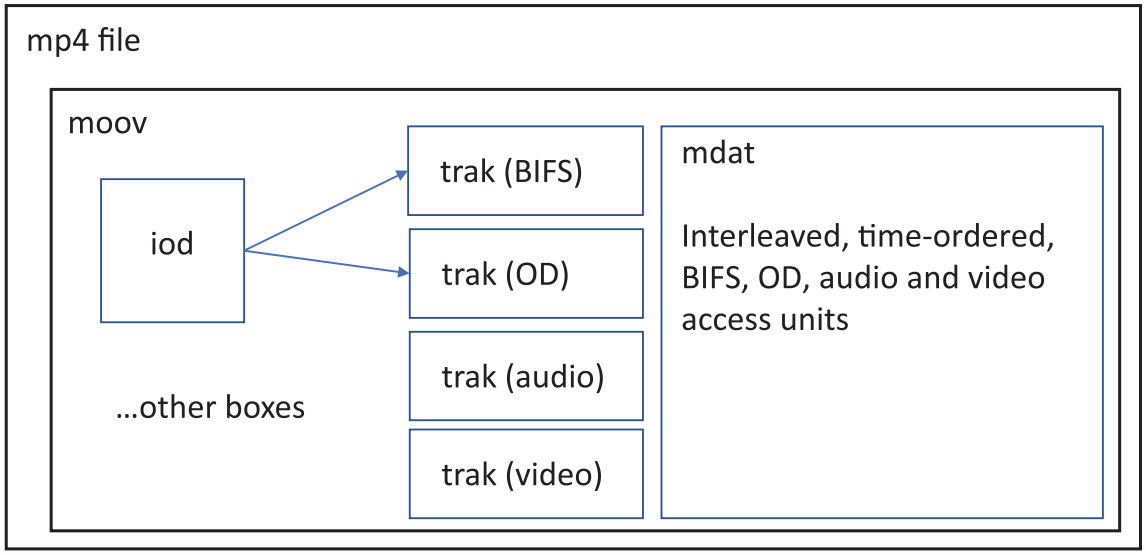

Figure 1 — Simple interchange file

In Figure 2, a set of files being used in the process of content creation is shown.

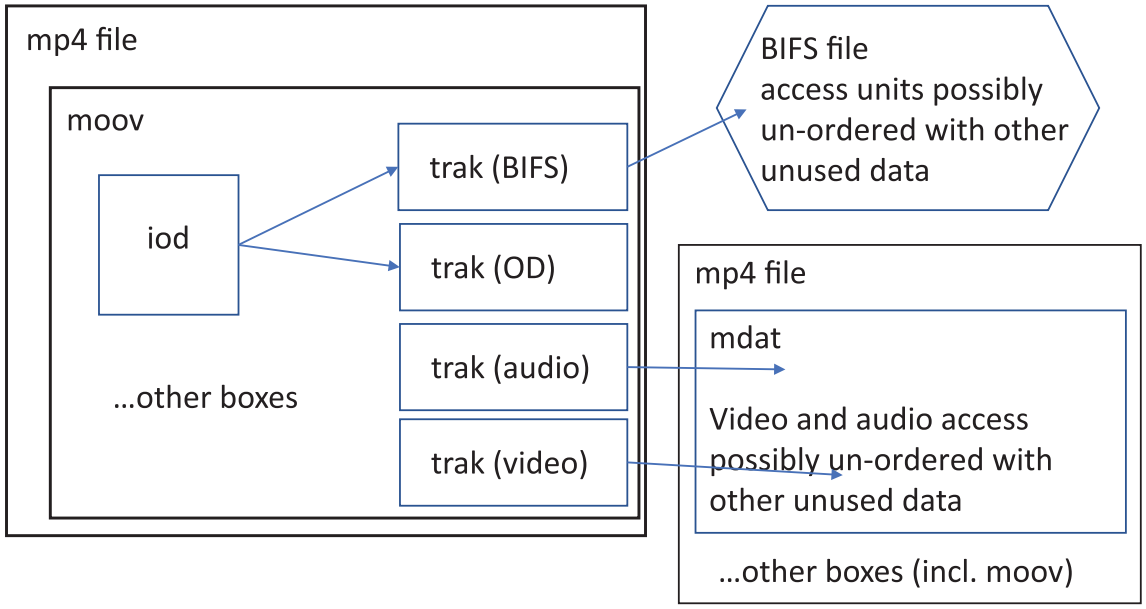

Figure 2 — Content creation file

© ISO/IEC 2020 – All rights reserved

Figure 3 shows a presentation prepared for streaming over a multiplexing protocol, only one hint track is required.

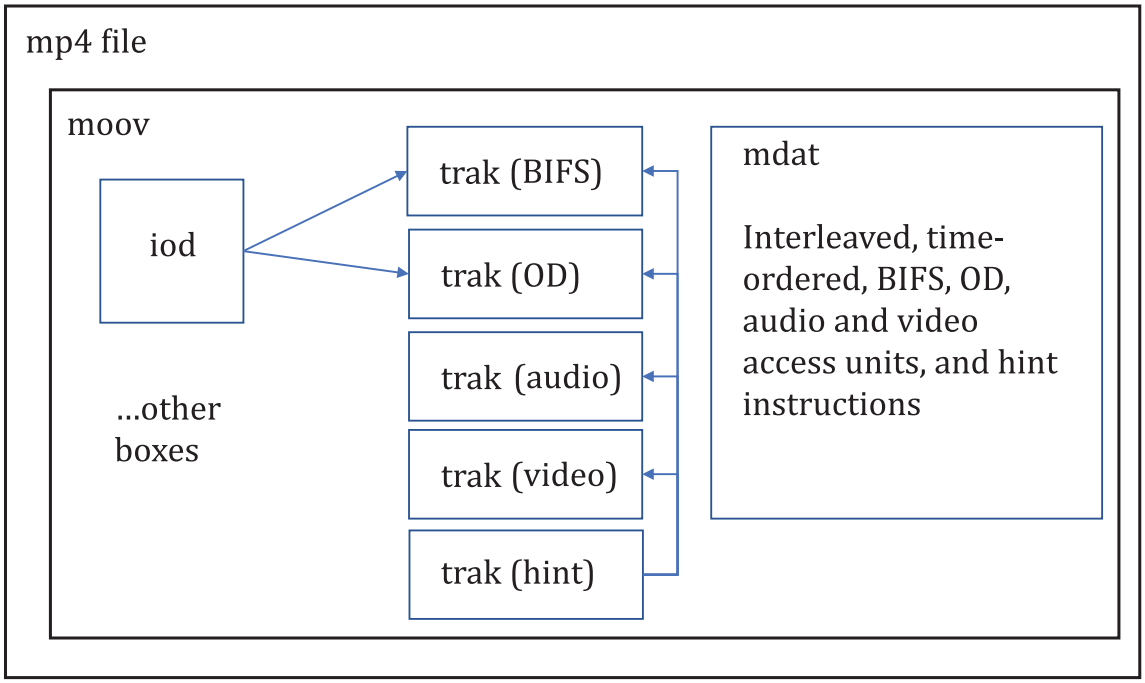

Figure 3 — Hinted presentation for streaming

Handling of audio timestamps and profile/level indication is covered in Annex A.

The International Organization for Standardization (ISO) and International Electrotechnical Commission (IEC) draw attention to the fact that it is claimed that compliance with this document may involve the use of a patent.

ISO and IEC take no position concerning the evidence, validity and scope of this patent right. The holder of this patent right has assured ISO and IEC that he/she is willing to negotiate licences under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statement of the holder of this patent right is registered with ISO and IEC. Information may be obtained from the patent database available at www.iso.org/patents.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights other than those in the patent database. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

© ISO/IEC 2020 – All rights reserved

Information technology — Coding of audio-visual objects —

Part 14: MP4 file format

1 Scope

This document defines the MP4 file format, as derived from the ISO Base Media File format.

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 14496-1:2010, *Information technology — Coding of audio-visual objects — Part 1: Systems*

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

© ISO/IEC 2020 – All rights reserved