INTERNATIONAL STANDARD

ISO/IEC 23001-11

Second edition
2019-03

Information technology — MPEG systems technologies —

Part 11: Energy-efficient media consumption (green metadata)

Technologies de l'information — Technologies des systèmes MPEG —

Partie 11: Consommation des supports éconergétiques (métadonnées vertes)

Reference number
ISO/IEC 23001-11:2019(E)

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Published in Switzerland

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Foreword

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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 second edition cancels and replaces the first edition (ISO/IEC 23001-11:2015), which has been technically revised. It also incorporates the Amendments ISO/IEC 23001-11:2015/Amd 1:2016 and ISO/IEC 23001-11:2015/Amd 2:2018. The main changes compared to the previous edition are as follows:

— specification of an HEVC SEI message carrying green metadata and modification of text specifying the carriage of green Metadata in an AVC SEI message so that the AVC and HEVC SEI messages are consistent;

— inclusion of Annex C which specifies conformance-verification procedures for the power-reduction technologies specified in this document, precises the role of the reference software for each technology and gives the links to reference softwares and test vectors.

— specification of HEVC Complexity metrics and improvement of the existing AVC Complexity metrics.

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Introduction

This document specifies the metadata (green metadata) that facilitates reduction of energy usage during media consumption as follows:

— the format of the metadata that enables reduced decoder power consumption;

— the format of the metadata that enables reduced display power consumption;

— the format of the metadata that enables media selection for joint decoder and display power reduction;

— the format of the metadata that enables quality recovery after low-power encoding.

This metadata facilitates reduced energy usage during media consumption without any degradation in the quality of experience (QoE). However, it is also possible to use this metadata to get larger energy savings, but at the expense of some QoE degradation.

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Information technology — MPEG systems technologies —

Part 11: Energy-efficient media consumption (green metadata)

1 Scope

This document specifies metadata for energy-efficient decoding, encoding, presentation and selection of media.

The metadata for energy-efficient decoding specifies two sets of information: complexity metrics (CM) metadata and decoding operation reduction request (DOR-Req) metadata. A decoder uses CM metadata to vary operating frequency and thus reduce decoder power consumption. In a point-to-point video conferencing application, the remote encoder uses the DOR-Req metadata to modify the decoding complexity of the bitstream and thus reduce local decoder power consumption.

The metadata for energy-efficient encoding specifies a quality metric that is used by a decoder to reduce the quality loss from low-power encoding.

The metadata for energy-efficient presentation specifies RGB-component statistics and quality levels. A presentation subsystem uses this metadata to reduce power by adjusting display parameters, based on the statistics, to provide a desired quality level from those provided in the metadata.

The metadata for energy-efficient media selection specifies decoder operation reduction ratios (DOR-Ratios), RGB-component statistics and quality levels. The client in an adaptive streaming session uses this metadata to determine decoder and display power-saving characteristics of available video representations and to select the representation with the optimal quality for a given power-saving.

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 13818-1, *Information technology — Generic coding of moving pictures and associated audio information — Part 1: Systems*

ISO/IEC 14496-10:—[1)], *Information technology — Coding of audio-visual objects — Part 10: Advanced video coding*

ISO/IEC 23001-10, *Information technology — MPEG systems technologies — Part 10: Carriage of timed metadata metrics of media in ISO base media file format*

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

ISO/IEC 23009-1:—[2)], *Information technology — Dynamic adaptive streaming over HTTP (DASH) — Part 1: Media presentation description and segment formats*

ISO/IEC/TR 23009-3, *Information technology — Dynamic adaptive streaming over HTTP (DASH) — Part 3: Implementation guidelines*

1) Under preparation. Stage at the time of publication: ISO/IEC DIS 14496-10:2018.

2) Under preparation. Stage at the time of publication: ISO/IEC FDIS 23009-1:2019.

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