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Information technology — Coded representation of immersive media —

Part 8: Network based media processing

Technologies de l'information — Représentation codée de médias immersifs —

Partie 8: Traitement des médias en réseau

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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 23090-8:2020), which has been technically revised.

The main changes are as follows:

— Annex F, NBMP function reference templates, was added;

— MPE capabilities were added;

— split rendering support was added.

A list of all parts in the ISO/IEC 23090 series can be found on the ISO and IEC websites.

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 and www.iec.ch/national-committees.

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Introduction

This document defines a framework that enables initializing and controlling media processing in a network. A network-based media processing (NBMP) source describes the requested media processing and provides information about the nature and format of the media data. Based on that, an NBMP workflow manager establishes the media processing workflow and informs the NBMP client that the workflow is ready, and that media processing can start. The media source(s) can then start transmitting their media to the network for processing.

An NBMP workflow can be understood as a connected graph of media processing tasks, each of which performs a well-defined media processing operation. The workflow manager ensures the correct operation of the workflow by configuring and monitoring each task as well as the workflow output. The workflow manager is responsible for the selection of the media processing functions and instantiating them as tasks based on the workflow description that is received from the NBMP client.

NBMP abstracts the underlying computing platform interactions to establish, load, instantiate and monitor the media processing entities that will run the media processing tasks. NBMP defines application programming interfaces (APIs) between an NBMP client and workflow manager; workflow manager and task(s); and an API to discover appropriate function(s). NBMP is media format and protocol agnostic. However, it identifies and signals the media, metadata and auxiliary information formats for data exchanged between media source, the workflow manager and tasks.

Annex C provides schema for identifying MPEG compatible functions.

Annex E provides an interface for managing function descriptions in function repository.

Annex F provides NBMP reference function.

Annex G provides NBMP workflow splitting.

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Information technology — Coded representation of immersive media —

Part 8: Network based media processing

1 Scope

The network-based media processing (NBMP) framework defines the interfaces including both data formats and application programming interfaces (APIs) among the entities connected through digital networks for media processing. Users can access and configure their operations remotely for efficient, intelligent processing. This document describes and manages workflows to be applied to the media data. This process includes uploading of media data to the network, instantiation of the media processing tasks, and configuration of the tasks. The framework enables dynamic creation of media processing pipelines, as well as access to processed media data and metadata in real-time or in a deferred way. The media and metadata formats used between the media source, workflow manager and media processing entities in a media processing pipeline are also specified.

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 9899, *Information technology — Programming languages — C*

ISO/IEC 23001-7, *Information technology — MPEG systems technologies — Part 7: Common encryption in ISO base media file format files*

IETF RFC 3339[1)], *Date and Time on the Internet: Timestamps*

IETF RFC 3986[2)], *Uniform Resource Identifier (URI): Generic Syntax*

IETF RFC 6381[3)], *The 'Codecs' and 'Profiles' Parameters for "Bucket" Media Types*

IETF RFC 7231[4)], *Hypertext Transfer Protocol (HTTP/1.1): Semantics and Content*

1) Available at: https://tools.ietf.org/html/rfc3339

2) Available at: https://tools.ietf.org/html/rfc3986

3) Available at: https://tools.ietf.org/html/rfc6381

4) Available at: https://tools.ietf.org/html/rfc7231

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