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Part 13: Video decoding interface for immersive media

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Foreword

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Introduction

The interfaces and operations specified in this document come as extensions of existing video decoding engine specifications exposing hardware video decoding capabilities.

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Information technology — Coded representation of immersive media —

Part 13:
Video decoding interface for immersive media

1 Scope

This document specifies the interfaces of a video decoding engine as well as the operations related to elementary streams and metadata that can be performed by this video decoding engine. To support those operations, this document also specifies SEI messages when necessary for certain video codecs.

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

ISO/IEC 23090-3, *Information technology — Coded representation of immersive media — Part 3: Versatile video coding*

ISO/IEC 23094-1, *Information technology — General video coding — Part 1: Essential video coding*

3 Terms and definitions

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

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
media stream
part of an *elementary stream* (3.2) or one or more aggregated *elementary streams* (3.2)

Note 1 to entry: Every elementary stream is a media stream, but the inverse is not true.

Note 2 to entry: A media stream may contain metadata such as non-VCL NAL units.

3.2
subframe
independently decodable unit smaller than a frame to which post-decoding processing by the decoder, if any, has been applied

3.3
video object
independently decodable substream of a video *elementary stream* (3.2)

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3.4
video object identifier
integer identifying a *video object* (3.4)

4 Abbreviated terms

API	application programming interface
ES	elementary stream
I	video object identifier
IVDI	input video decoding interface
MDS	media stream
NAL	network abstraction layer
OLS	output layer set
OVDI	output video decoding interface
PPS	picture parameter set
SEI	supplemental enhancement information
SPS	sequence parameter set
VCL	video coding layer
VDE	video decoding engine

5 Video decoding engine

5.1 General

The video decoding engine (VDE) enables the decoding, the synchronization and the formatting of associated media streams into elementary streams. The media streams are fed through the input video decoding interface (IVDI) of the VDE and provided to the subsequent elements of the rendering pipeline via the output video decoding interface (OVDI) in their decoded form. Between the input and the output, the VDE may extract and merge independently decodable regions from a set of input media streams via the input formatting function to generate a set of elementary streams that are fed into the video decoder instances which run inside the engine. The VDE can execute a merging operation or an extraction operation on the input media streams such that the number of running video decoder instances is different from the number of input media streams required by the application. For example, a VDE can be incapable of decoding a single 4K input media stream with one decoder instance, but it can decode some of the independently decodable regions, at a lower resolution, present in that input media stream. To this end, the VDE should first verify the availability of sufficient resources to run in parallel those video decoder instances.

Figure 1 represents the architecture of the VDE and the associated IVDI and OVDI interfaces.

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