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AMENDMENT 1
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**Information technology — Coded
representation of immersive media —**

**Part 14:
Scene description**

**AMENDMENT 1: Support for immersive
media codecs in scene description**

*Technologies de l'information — Représentation codée de média
immersifs —*

Partie 14: Description de scènes

*AMENDEMENT 1: Support pour les codecs des médias immersifs dans
la description de scènes*

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CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
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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 or www.iec.ch/members_experts/refdocs).

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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*.

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

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Information technology — Coded representation of immersive media —

Part 14: Scene description

AMENDMENT 1: Support for immersive media codecs in scene description

Normative references

Add the following references:

ISO/IEC 23090-5, *Information technology — Coded Representation of Immersive Media — Part 5: Visual Volumetric Video-based Coding (V3C) and Video-based Point Cloud Compression (V-PCC)*

4.2

Replace Figure 1 by the following figure

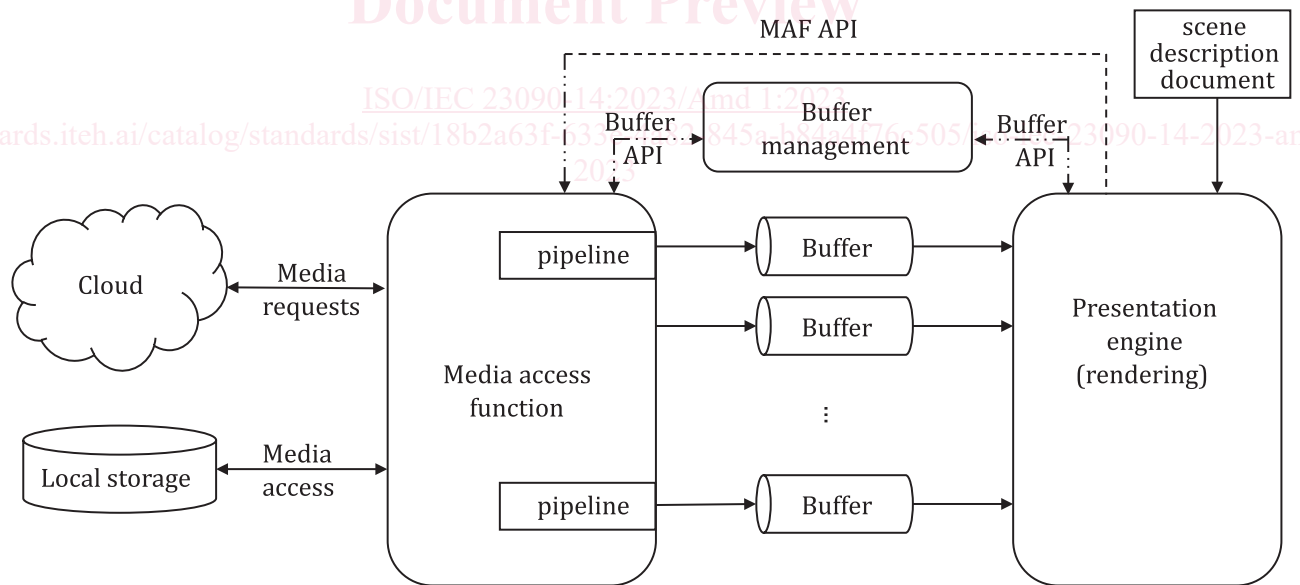


Figure 1 — Scene description reference architecture

3.2

Add the following to the list of abbreviated terms in subclause 3.2:

- MIV MPEG immersive video
- ERP Equirectangular projection
- PLR Point Local Reconstruction
- EOM Enhanced Occupancy Mode

5.1.1

Add the following sentence after Figure 3

Additional extensions and buffer formats for the support of MPEG-specified immersive media formats in MPEG-I scene description are specified in Annex G.

5.3.1.2, Table 11

Change the Description of the format attribute as follows:

format	string	RGB	0	<p>Indicates the format of the pixel data for this video texture. The allowed values are: RED, GREEN, BLUE, RG, RGB, RGBA, BGR, BGRA, DEPTH_COMPONENT. The semantics of these values are defined in Table 8.3 of OpenGL specification [2].</p> <p>Additionally, YCbCr formats are supported. The semantics for the YCbCr formats are defined in Table 76 in Vulkan specification [Vulkan 1.3]. A sampler with the <code>MPEG_sampler_YCbCr</code> extension shall be linked to a YCbCr texture.</p> <p>The number of components shall match the type indicated by the referenced accessor. Normalization of the pixel data shall be indicated by the normalized attribute of the accessor.</p>
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5.2.1.2, Table 6,

Change the Description of the track attribute as follows:

Table 6 — Definitions of items in the tracks array of MPEG_media.alternative extension

Name	Type	Default	Usage	Description
track	string	N/A	M	<p>URL fragment to access the track within the media alternative.</p> <p>The URL structure is defined for the following formats:</p> <p>DASH: Using MPD Anchors (URL fragments) as defined in ISO/IEC 23009-1:2019:Annex C (Table C.1).</p> <p>ISO/BMFF: URL fragments as specified in ISO/IEC 14496-12:2020:Annex C.</p> <p>SDP: stream identifier of the media stream as defined in Annex C.</p> <p>When V3C data is referenced in the scene description document as in item in MPEG_media.alternative.tracks and the referenced item corresponds to an ISO/BMFF track, the following applies:</p> <ul style="list-style-type: none"> — For single-track encapsulated V3C data, the referenced track in MPEG_media shall be the V3C bitstream track. — For multi-track encapsulated V3C data, the referenced track in MPEG_media shall be the V3C atlas track. <p>When G-PCC data is referenced by the scene description file as an item in MPEG_media.alternative.tracks and the referenced item complies with the provisions of track in ISO/BMFF, the following applies:</p> <ul style="list-style-type: none"> — For single-track encapsulated G-PCC data, the track referenced in MPEG_media shall be the G-PCC bitstream track; — For multi-track encapsulated G-PCC data, the track referenced in MPEG_media shall be the G-PCC geometry bitstream track.
codecs	string	N/A	M	<p>The codecs parameter, as defined in IETF RFC 6381, of the media included in the track.</p> <p>When the track includes different types of codecs (e.g. the AdaptationSet includes Representations with different codecs), the codecs parameter may be signaled by comma-separated list of values of the codecs.</p>

Annex B

Add the following entries to Table B.1 in Annex B:

Table B.1 — MPEG attribute registry

Name	Accessor type(s)	Component type(s)	Description	Reference and example shader program
_MPEG_V3C_ATTR_REFLECTANCE	scalar	5123	indicates the reflectance information that is associated with each point in a volumetric frame	
_MPEG_V3C_ATTR_MATERIAL_ID	scalar	5123	indicates a supplemental information that identifies material type of a point in a volumetric frame	
_MPEG_V3C_ATTR_TRANSPARENCY	scalar	5123	indicates the transparency information that is associated with each point in a volumetric frame	

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Annex F

Add the following subclauses to Annex F:

F.10 MPEG_primitive_V3C

In the example downloadable from [https://standards.iso.org/iso-iec/23090/-14/ed-1/en/amd/1/example MPEG_primitive_V3C](https://standards.iso.org/iso-iec/23090/-14/ed-1/en/amd/1/example_MPEG_primitive_V3C), a usage of the MPEG_primitive_V3C is presented.

F.11 MPEG_sampler_YCbCr

In the example downloadable from [https://standards.iso.org/iso-iec/23090/-14/ed-1/en/amd/1/example MPEG_sampler_YCbCr](https://standards.iso.org/iso-iec/23090/-14/ed-1/en/amd/1/example_MPEG_sampler_YCbCr), a usage of the MPEG_sampler_YCbCr extension is presented.

Add Annex G with the following content

Annex G (normative)

Support for MPEG-I Media

G.1 MPEG_primitive_V3C extension

G.1.1 General

In order to support V3C compressed objects in MPEG-I scene description, the `MPEG_media` extension is used to refer to V3C compressed bitstreams.

The presentation engine may support the operations to perform the 3D reconstruction of decoded V3C components as indicated in the Figure 2. The presentation engine accesses the decoded V3C data through buffers.

The syntax of the V3C object is provided as an extension to `mesh.primitive` in a scene description format. The extension refers to the decoded data of a V3C object. Each decoded V3C component is signalled using properties defined in the `MPEG_primitive_V3C` extension. The extension is specific to objects coded with a V3C compression scheme (i.e., ISO/IEC 23090-5 or ISO/IEC 23090-12).

Usage of the extension shall be listed in the `extensionsUsed` top-level glTF property.

```
"extensionsUsed": [
  "MPEG_primitive_V3C"
]
```

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Figure G.1 depicts the structure of the V3C mesh compression extension:

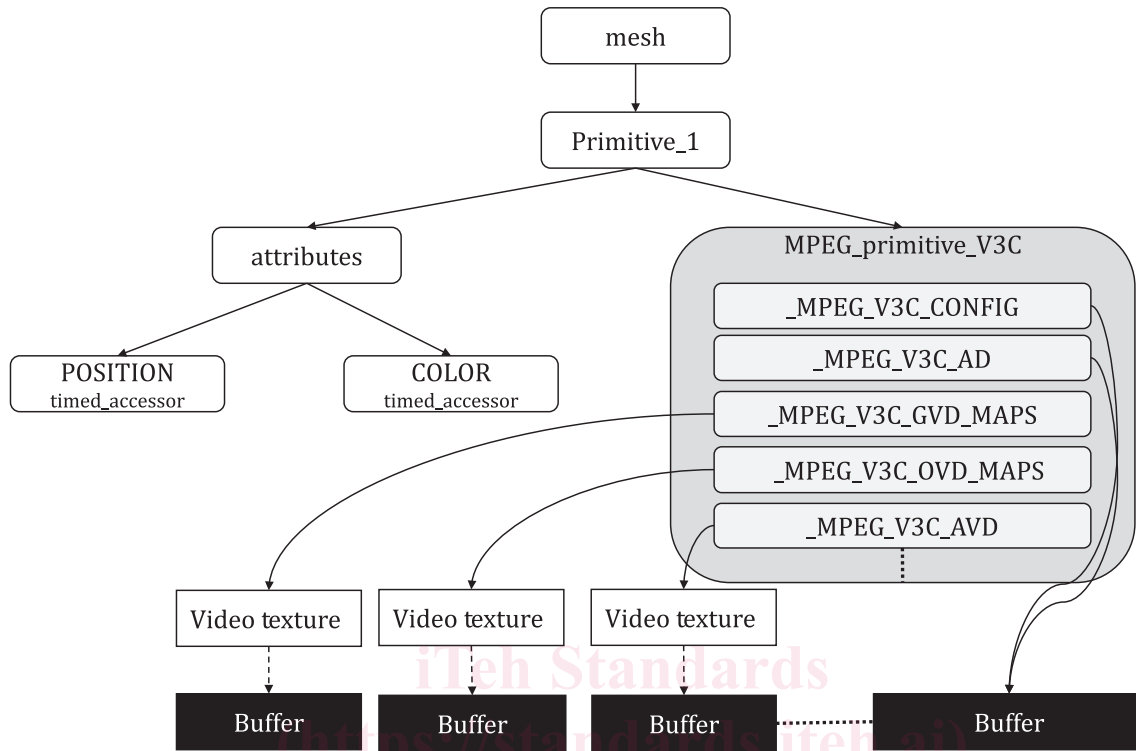


Figure G.1 — Example structure of V3C compressed primitive

If the Presentation Engine does not support the MPEG_primitive_V3C extension, It shall request the reconstructed raw data as described by the primitive attributes.

G.1.2 Semantics

An MPEG_primitive_V3C extension refers to several V3C components, containing the decoded projected maps and metadata necessary such as atlas data for the 3D reconstruction process.

Table G.1 provides a list of the possible components and their description:

Table G.1 — MPEG_primitive_V3C properties

Name	Type	Default	Usage	Description
_MPEG_V3C_CONFIG	integer	N/A	M	This component provides a reference to a timed accessor that contains configuration information that is applicable to a sequence of frames of the V3C decoded mesh primitive. The binary format of the configuration buffer is provided in clause G.1.3.

Legend:

For attributes: M=mandatory, O=optional, OD=optional with default value, CM=conditionally mandatory.