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**CODING OF MOVING PICTURES AND AUDIO**

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# Scope

This document provides information and agreed processes in order to support the development of ISO/IEC 23090-14, "MPEG-I Scene Description" as well as ISO/IEC 23090-24, "Conformance and Reference Software for MPEG-I Scene Description".

# Time Plans and Projects

* ISO/IEC FDIS 23090-14 Information technology — Coded representation of immersive media — Part 14: Scene Description for MPEG Media
  + <https://www.iso.org/standard/80900.html>
  + <https://sd.iso.org/projects/project/80900/overview>

A screenshot of a computer

Description automatically generated

* ISO/IEC 23090-24 Information technology — Coded representation of immersive media — Part 24: Conformance and Reference Software for Scene Description for MPEG Media
  + Editors: Gurdeep Singh Bhullar
  + <https://www.iso.org/standard/83696.html>
  + <https://sd.iso.org/projects/project/83696/overview>

A screenshot of a computer

Description automatically generated

* ISO/IEC DIS 23090-14/AMD 1 Information technology — Coded representation of immersive media — Part 14: Scene description — Amendment 1: Support for immersive media codecs in scene description
  + <https://www.iso.org/standard/84769.html>
  + <https://sd.iso.org/projects/project/84769/overview>

A screenshot of a computer

Description automatically generated

* ISO/IEC DIS 23090-14/AMD 2 Information technology — Coded representation of immersive media — Part 14: Scene description — Amendment 2: Support for Haptics, Augmented Reality, Avatars, Interactivity, MPEG-I Audio and Lighting
  + https://www.iso.org/standard/86439.html
  + <https://sd.iso.org/projects/project/86439/overview>
  + Editors: Imed Bouazizi, Emmanuel Thomas, Patrice Hirtzlin

A screenshot of a computer

Description automatically generated

* ISO/IEC 23090-24 Information technology — Coded representation of immersive media — Part 24: Conformance and reference software for scene description — Amendment 1: Conformance and reference software for scene description on haptics, augmented reality, avatars, interactivity and lighting
  + Editors: Imed Bouazizi, Gurdeep Singh Bhullar
  + https://www.iso.org/standard/87584.html
  + https://sd.iso.org/projects/project/87584/overview

A screenshot of a computer

Description automatically generated

# Extending Khronos glTF2.0

## General

Based on the agreement during MPEG#128, MPEG-I Scene Description is developed as an extension to Khronos' glTF2.0 specification. This specification can be accessed here: <https://github.com/KhronosGroup/glTF/blob/master/specification/2.0/README.md>

According to the specification, glTF defines an extension mechanism that allows the base format to be extended with new capabilities. Any glTF object can have an optional extensions property. For details see <https://github.com/KhronosGroup/glTF/blob/master/specification/2.0/README.md#specifying-extensions>. For more information on glTF extensions, consult the [extensions registry specification](https://github.com/KhronosGroup/glTF/blob/master/extensions/README.md).

glTF supports different ways on extending the specification as documented here: <https://github.com/KhronosGroup/glTF/blob/master/extensions/README.md#promoting-extensions>

The following principles are agreed:

* MPEG develops extensions to Khronos glTF2.0 under the *Vendor Extensions framework*. Contributing companies should be aware of this. If contributions do not provide a statement that says otherwise, it is expected that the proponents agree to this.
* MPEG has been assigned an extension with the prefix MPEG <https://github.com/KhronosGroup/glTF/blob/master/extensions/Prefixes.md>. Contact person is the MPEG convenor, the JTC1 SC29 WG3 MPEG Systems chair as well as the chair of the MPEG-I Scene Description BOG. An update request has been submitted here: https://github.com/KhronosGroup/glTF/issues/2247
* If MPEG contributors are generally interested that their proposal may be considered as a KHR extension without any binding commitment, input contributions may state so. However, such a statement or the absence of such a statement does not impact the processing of a contribution in the context of the MPEG-I scene description work.

## Template for MPEG Extensions submitted to Khronos

It is proposed that all MPEG agreed extensions after DIS and FDIS has been issued, are added to the Khronos repository as follows

* Contributors
  + ISO/IEC SC29 WG3 (MPEG Systems) - Scene Description Breakout Group
  + Contacts: Thomas Stockhammer (MPEG-I Scene Description BoG Chair, tsto@qti.qualcomm.com)
* Status
  + Draft at DIS
  + Stable at FDIS
  + Based on [ISO/IEC FDIS 23090-14](https://www.iso.org/standard/80900.html)
* Dependencies
  + Written against the glTF 2.0 spec
* Overview:
  + Introduction should be provided on the extension
  + Pointer to ISO/IEC 23090-14 where the extension is defined
* glTF Schema Updates
  + Pointer to MPEG schema updates
* JSON Schema
  + Link to schema
* Known Implementation
  + Pointer to reference software: [ISO/IEC 23090-24](https://www.iso.org/standard/83696.html)
* Resources:
  + [ISO/IEC FDIS 23090-14](https://www.iso.org/standard/80900.html), Information technology — Coded representation of immersive media — Part 14: Scene Description
  + [ISO/IEC WD 23090-24](https://www.iso.org/standard/83696.html), Information technology — Coded representation of immersive media — Part 24: Conformance and Reference Software for Scene Description for MPEG Media
  + Comments may be submitted here: <https://github.com/MPEGGroup/Scene-Description>
* Best Practices:
  + Implementation Guidelines, Fallback mechanisms, etc.
* License:
  + Copyright (c), ISO/IEC
  + The use of the "MPEG scene description extensions" is subject to the license as accessible here: <https://standards.iso.org/> and is subject to the IPR policy as accessible here: <https://www.iso.org/iso-standards-and-patents.html>.

The extensions are also collected in the internal github here: here <http://mpegx.int-evry.fr/software/MPEG/Systems/SceneDescription/Specification/23090-14/-/tree/master/Extensions>.

## Status Extension Submission for first Edition

The pull request was finally merged on Feb 28, 2023

Khronos adds MPEG-I Scene Description Extensions to glTF2.0  
  
As chairman of the MPEG-I Scene Description group, it is my great pleasure to announce a milestone that we achieved in course of the collaboration with [The Khronos Group](https://www.linkedin.com/company/the-khronos-group/), in particular the 3D Formats working group: Khronos adopts the MPEG-I Scene Description extensions as defined in ISO/IEC 23090-14 as extensions to glTF2.0.  
  
This work happened within a long-lasting collaboration and dedication of many individuals, in particular to mention [Imed Bouazizi](https://www.linkedin.com/in/ACoAAABzII8BOGSlKHQJx0qsSleydHO4Jle_u9g), [Lukasz Kondrad](https://www.linkedin.com/in/ACoAAAA_W7MBW6HtQKZOIdZu4ULEFmu3sUi9KV0) [Yago Sanchez de la Fuente](https://www.linkedin.com/in/ACoAABbg1eYBz6ghlVhx02wl-M8UjdGaJ1rb2T8) [Ozgur Oyman](https://www.linkedin.com/in/ACoAAAAlWk8BoqVRVOMs6K9VmNP-L2WBMX7_7YQ) [Mary-Luc Champel](https://www.linkedin.com/in/ACoAAAAwDbEBviagkk33BWszQ4QoaM7aAb-7ihQ) Gurdeep Singh [Gaëlle Martin-Cocher](https://www.linkedin.com/in/ACoAAAAUBEUBKbCilTsq_kuS_2_6wxYyEkp6uWE) [Emmanuel Thomas](https://www.linkedin.com/in/ACoAAAJvsVcBFQvM_uLkeZX2_oN1i2hZlOIWky4) [Neil Trevett](https://www.linkedin.com/in/ACoAAAAdd-gBwt27NDRKFIyeasKdoIOrxKb8SXM) [Youngkwon Lim](https://www.linkedin.com/in/ACoAABeikS4BduV21BklETEPce2ccT18_ydnwrk) [Alexey Medvedev](https://www.linkedin.com/in/ACoAAAHPxh0BdrQofs-Yme26VI5QOGpQW9mGVy4) [Alexey Knyazev](https://www.linkedin.com/in/ACoAADWpIJoBljbJMD89dBLMPXIGS6zt6Rh745U) [Leonardo Chiariglione](https://www.linkedin.com/in/ACoAAAABm4wBfQbOVw0iZ0JuU4-i-m4E7-tiP0w). The extensions are documented here: https://github.com/KhronosGroup/glTF/blob/main/extensions/README.md   
  
These efforts are the foundation work in the [Metaverse Standards Forum](https://www.linkedin.com/company/metaverse-standards-forum/) and [3GPP](https://www.linkedin.com/company/3gpp/), and are only the starting point. More extensions to be expected. For details on the extensions and MPEG-I scene description, refer to our white paper [here](https://lnkd.in/eazc69Ba).



In addition, the extensions are added to the main extension page: <https://github.com/haudiobe/glTF/blob/main/extensions/README.md>

## Status Extension Submission for second Edition

A first set of extensions was created as output from MPEG#141 in

|  |  |  |  |
| --- | --- | --- | --- |
| [MDS22339](https://dms.mpeg.expert/doc_end_user/current_document.php?id=86339&id_meeting=193) | Draft registration of Khronos extensions 2nd edition | |  | | --- | | [MDS22339\_WG03\_N00815](https://dms.mpeg.expert/doc_end_user/documents/141_OnLine/wg11/MDS22339_WG03_N00815.zip) | |

First amendment (2  branches, 2 extensions)

* [MPEG\_primitive\_V3C](https://github.com/haudiobe/glTF/tree/MPEG_primitive_V3C/extensions/2.0/Vendor/MPEG_primitive_V3C)
* [MPEG\_sampler\_YCbCr](https://github.com/haudiobe/glTF/tree/MPEG_sampler_YCbCr/extensions/2.0/Vendor/MPEG_sampler_YCbCr)

Second amendment (5  branches, 7 extensions)

* [MPEG\_node\_avatar](https://github.com/haudiobe/glTF/tree/MPEG_avatar/extensions/2.0/Vendor/MPEG_node_avatar)
* <https://github.com/haudiobe/glTF/tree/MPEG_haptic/extensions/2.0/Vendor>
  + [MPEG\_haptic](https://github.com/haudiobe/glTF/tree/MPEG_haptic/extensions/2.0/Vendor/MPEG_haptic)
  + [MPEG\_material\_haptic](https://github.com/haudiobe/glTF/tree/MPEG_haptic/extensions/2.0/Vendor/MPEG_material_haptic)
* [MPEG\_lights\_texture\_based](https://github.com/haudiobe/glTF/tree/MPEG_lights_texture_based/extensions/2.0/Vendor/MPEG_lights_texture_based)
* <https://github.com/haudiobe/glTF/tree/MPEG_interactivity/extensions/2.0/Vendor>
  + [MPEG\_scene\_interactivity](https://github.com/haudiobe/glTF/tree/MPEG_interactivity/extensions/2.0/Vendor/MPEG_scene_interactivity)
  + [MPEG\_node\_interactivity](https://github.com/haudiobe/glTF/tree/MPEG_interactivity/extensions/2.0/Vendor/MPEG_node_interactivity)
* <https://github.com/haudiobe/glTF/tree/MPEG_anchor/extensions/2.0/Vendor>
  + [MPEG\_scene\_anchor](https://github.com/haudiobe/glTF/tree/MPEG_anchor/extensions/2.0/Vendor/MPEG_scene_anchor)
  + [MPEG\_node\_anchor](https://github.com/haudiobe/glTF/tree/MPEG_anchor/extensions/2.0/Vendor/MPEG_node_anchor)

However, we identified, that a workflow through a non-private GitHub repository and an internal approval process is preferable in acting towards Khronos.

## Process and Workflow

For the workflow, the following aspects should be considered:

1. Every feature in MPEG-I SD creates its own pull request
2. A feature may consist of multiple extensions
3. The extensions should be submitted as part of addition of the technology to the standard to MPEG systems
4. A public repository in MPEG is used to host the mirror, but also some extensions that are not yet approved by Khronos. This GitHub repository can also be used by the public to provide comments
5. Care should be taken on keeping consistency with what is added to the standard and also to preliminary drafts sent for ballot
6. We also maintain a repository internally that needs to be taken care of
7. A timely visibility of the extensions to Khronos and general public is important.
8. It should not contradict ISO rules and policies.

A high-level workflow is shown in Figure 1.

A diagram of a diagram

Description automatically generated

Figure 1 High-level workflow

The following detailed workflow implementation was proposed

* Initial set up (only happens once in the course of developing the MPEG-I SD standard):
  + A fork of the Khronos glTF repository on GitHub is created under the MPEGGroup account on GitHub. This should include all 1st edition extensions.
  + The glTF repository fork under MPEGGroup on GitHub is cloned as a new repository on the MPEG GitLab repository under the Scene Description project.
* From that point onwards, the MPEG/extensions GitLab repository is the repository where all the updates are collected from the SD BoG decisions.
* When work on a new feature commences in MPEG-I SD, a new branch in the MPEG/extensions GitLab repository is created for the new feature and updates are made to that internal branch as modifications are agreed by the group.
* Once the document to which the new feature belongs (e.g., an amendment or a new edition) reaches CD stage and a ballot is to be initiated, the following must be done:
  + the MPEG/extensions GitLab branch is tagged with the edition number and the ISO stage
  + the MPEG/glTF GitLab branch is tagged with the edition number and the ISO stage
* When the document reaches DIS stage and a ballot is initiated, the following must be done:
  + the MPEG/extensions and MPEG/glTF GitLab branches are tagged with the edition number and the ISO stage. The following tag is proposed
    - iso\_number|ned|iso\_document
    - Examples
      * 23090-14|1ed|CD
      * 23090-14|2ed|DAmd 2
  + the MPEG/extensions and MPEG/glTF GitLab branches are pushed to the corresponding MPEGGroup repository on GitHub
    - executed manually by somebody from a local repo with both remote endpoint GitLab and GitHub
    - we need a responsible person. A script may be created
  + a pull request from the MPEGGroup/glTF is created against the Khronos/glTF GitHub repository to start soliciting feedback and comments from the DIS ballot
    - a draft at DIS stage and later changed to a final pull request at FDIS
  + inform Khronos of the existence of these draft extensions in an LS
* Any feedback or comments on the pull request created on the Khronos GitHub repository that the group agrees is useful and should be captured by a national body (NB) comment on the ballot.
* Other feedback may also be received from the MPEGGroup/extensions which should also be addressed via MPEG input contributions and/or NB comments.
* When the document reaches FDIS stage and a ballot is initiated, the following must be done:
  + the MPEG/extensions and MPEG/glTF GitLab branches are tagged with the edition number and the ISO stage
  + The following tag is proposed
    - iso\_number|ned|iso\_document
    - Examples
      * 23090-14|1ed|CD
      * 23090-14|2ed|DAmd 2
  + the MPEG/extensions and MPEG/glTF GitLab branches are pushed to the corresponding MPEGGroup repository on GitHub
    - executed manually by somebody from a local repo with both remote endpoint GitLab and GitHub
    - we need a responsible person. A script may be created
* When the pull request on the Khronos GiHub repository is accepted and merged, the master (main) branches on both the MPEGGroup GitHub repository and the internal MPEG GitLab repositories should by synched with the Khronos GitHub repository.

Alternative workflow (update to above workflow):

* When DIS is issued

1. Create fork on MPEG GitHub repository of Khronos glTF repository, and take the extensions from the MPEG GitLab repository and add them "manually"
2. Create a pull request to Khronos as “draft”
3. All updates to the extensions are done on the fork on MPEG GitHub repository
4. When we release a new version of the standard (e.g., improvement of DIS, FDIS, etc.), we create a clone of the public MPEG GitHub repository and add it to the internal MPEG GitLab in order to maintain spec consistency

# Communication with Khronos

## Overview

Khronos has active work in the context of glTF2.0, see the KHR extensions under development here: <https://github.com/KhronosGroup/glTF/blob/master/extensions/README.md>. It is also identified that there is an overlap between MPEG members and glTF participants. Khronos and graphics experts meet in Khronos meetings, but also at developer and research conferences such as GDC and Siggraph. For meetings, please refer to <https://www.khronos.org/events/>.

Khronos Member Meetings occur 3 times per year and offer the opportunity for Khronos members to come together in a face-to-face environment to discuss technical work, industry feedback, network with colleagues and have some fun.

The scheduled upcoming meetings are here:

|  |  |  |
| --- | --- | --- |
| Meeting | Date | Location |
| F2F Osaka 2023 | May 8-12, 2023 | Osaka, Japan |

## Communication prior to MPEG#141

### MPEG#133

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| [MDS20159](https://dms.mpeg.expert/doc_end_user/current_document.php?id=78184&id_meeting=185) | WG 03 | 00180 | All | Liaison to Khronos on Scene Description for MPEG Media | WG 03 MPEG Systems | [MDS20159\_WG03\_N00180](https://dms.mpeg.expert/doc_end_user/documents/133_OnLine/wg11/MDS20159_WG03_N00180.zip) |

### MPEG#135

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| [MDS20563](https://dms.mpeg.expert/doc_end_user/current_document.php?id=79965&id_meeting=187) | WG 03 | 00309 | WG 03 All | Liaison statement to Khronos on MPEG-I Scene Description | WG 03 MPEG Systems | [MDS20563\_WG03\_N00309](https://dms.mpeg.expert/doc_end_user/documents/135_OnLine/wg11/MDS20563_WG03_N00309.zip) |

### MPEG#136

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| [MDS21056](https://dms.mpeg.expert/doc_end_user/current_document.php?id=81135&id_meeting=188) | WG 03 | 00434 | WG 03 All | Liaison statement to Khronos on MPEG-I Scene Description | WG 03 MPEG Systems | [MDS21056\_WG03\_N00434](https://dms.mpeg.expert/doc_end_user/documents/136_OnLine/wg11/MDS21056_WG03_N00434.zip) |

### MPEG#137

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| --- | --- | --- | --- | --- | --- | --- |
| [MDS21327](https://dms.mpeg.expert/doc_end_user/current_document.php?id=82177&id_meeting=189) | WG 03 | 00511 | WG 03 All | Liaison statement to Khronos on MPEG-I Scene Description | WG 03 MPEG Systems | [MDS21327\_WG03\_N00511](https://dms.mpeg.expert/doc_end_user/documents/137_OnLine/wg11/MDS21327_WG03_N00511.zip) |

### MPEG#138

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| [MDS21435](https://dms.mpeg.expert/doc_end_user/current_document.php?id=82962&id_meeting=190) | WG 03 | 00542 | WG 03 MPEG-I | Registration of Khronos extensions | WG 03 MPEG Systems | [MDS21435\_WG03\_N00542](https://dms.mpeg.expert/doc_end_user/documents/138_OnLine/wg11/MDS21435_WG03_N00542.zip) |
| [MDS21603](https://dms.mpeg.expert/doc_end_user/current_document.php?id=83120&id_meeting=190) | WG 03 | 00588 | WG 03 All | Liaison statement to Khronos on mesh attributes in glTF 2.0 | WG 03 MPEG Systems | [MDS21603\_WG03\_N00588](https://dms.mpeg.expert/doc_end_user/documents/138_OnLine/wg11/MDS21603_WG03_N00588.zip) |

### MPEG#139

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| --- | --- | --- | --- | --- | --- | --- |
| [MDS21744](https://dms.mpeg.expert/doc_end_user/current_document.php?id=83961&id_meeting=191) | WG 03 | 00615 | WG 03 MPEG-I | Registration of Khronos extensions | WG 03 MPEG Systems | [MDS21744\_WG03\_N00615](https://dms.mpeg.expert/doc_end_user/documents/139_OnLine/wg11/MDS21744_WG03_N00615.zip) |
| [MDS21885](https://dms.mpeg.expert/doc_end_user/current_document.php?id=84100&id_meeting=191) | WG 03 | 00671 | WG 03 All | Liaison statement to Khronos on MPEG-I Scene description | WG 03 MPEG Systems | [MDS21885\_WG03\_N00671](https://dms.mpeg.expert/doc_end_user/documents/139_OnLine/wg11/MDS21885_WG03_N00671.zip) |

### MPEG#140

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| [MDS21968](https://dms.mpeg.expert/doc_end_user/current_document.php?id=85069&id_meeting=192) | WG 03 | 00689 | 2022-10-28 15:29:21 | 2023-01-15 18:33:04 | WG 03 MPEG-I | Final registration of Khronos extensions for 1st edition | WG 03 MPEG Systems | [MDS21968\_WG03\_N00689](https://dms.mpeg.expert/doc_end_user/documents/140_Mainz/wg11/MDS21968_WG03_N00689.zip) |
| [MDS22198](https://dms.mpeg.expert/doc_end_user/current_document.php?id=85289&id_meeting=192) | WG 03 | 00751 | 2022-10-28 15:29:21 | 2023-01-15 18:37:40 | WG 03 MPEG-I | Draft registration of Khronos extensions 2nd edition | WG 03 MPEG Systems | [MDS22198\_WG03\_N00751](https://dms.mpeg.expert/doc_end_user/documents/140_Mainz/wg11/MDS22198_WG03_N00751.zip) |
| [MDS22200](https://dms.mpeg.expert/doc_end_user/current_document.php?id=85291&id_meeting=192) | WG 03 | 00753 | 2022-10-28 15:29:21 | 2023-01-15 18:38:56 | WG 03 All | Liaison to Khronos on MPEG-I Scene Description | WG 03 MPEG Systems | [MDS22200\_WG03\_N00753](https://dms.mpeg.expert/doc_end_user/documents/140_Mainz/wg11/MDS22200_WG03_N00753.zip) |

### MPEG#141

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| [MDS Number](https://dms.mpeg.expert/doc_end_user/current_meeting.php?id_meeting=193&type_order=0&sql_type=document_number) | [Group](https://dms.mpeg.expert/doc_end_user/current_meeting.php?id_meeting=193&type_order=0&sql_type=document.id_sub_group) | [G-Number](https://dms.mpeg.expert/doc_end_user/current_meeting.php?id_meeting=193&type_order=0&sql_type=document_gnumber) | [Created](https://dms.mpeg.expert/doc_end_user/current_meeting.php?id_meeting=193&type_order=0&sql_type=document_date_time) | [Uploaded](https://dms.mpeg.expert/doc_end_user/current_meeting.php?id_meeting=193&type_order=0&sql_type=upload_document_date_time) | [Standard](https://dms.mpeg.expert/doc_end_user/current_meeting.php?id_meeting=193&type_order=0&sql_type=document.id_group) | [Title](https://dms.mpeg.expert/doc_end_user/current_meeting.php?id_meeting=193&type_order=0&sql_type=title) | [Source](https://dms.mpeg.expert/doc_end_user/current_meeting.php?id_meeting=193&type_order=0&sql_type=authors) | |  |  | | --- | --- | | [Download](javascript:%20submitform()) |  | |
| [MDS22293](https://dms.mpeg.expert/doc_end_user/current_document.php?id=86293&id_meeting=193) | WG 03 | 00769 | 2023-01-21 14:27:20 | 2023-03-20 18:01:49 | WG 03 MPEG-I | Revised registration of Khronos extensions for 1st edition | WG 03 MPEG Systems | |  |  | | --- | --- | | [MDS22293\_WG03\_N00769](https://dms.mpeg.expert/doc_end_user/documents/141_OnLine/wg11/MDS22293_WG03_N00769.zip) |  | |
| [MDS22339](https://dms.mpeg.expert/doc_end_user/current_document.php?id=86339&id_meeting=193) | WG 03 | 00815 | 2023-01-21 14:27:20 | 2023-04-24 10:03:30 | WG 03 MPEG-I | Draft registration of Khronos extensions 2nd edition | WG 03 MPEG Systems | |  | | --- | | [MDS22339\_WG03\_N00815](https://dms.mpeg.expert/doc_end_user/documents/141_OnLine/wg11/MDS22339_WG03_N00815.zip) | |

## Communication at MPEG#142

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| [MDS22619](https://dms.mpeg.expert/doc_end_user/current_document.php?id=87765&id_meeting=194) | WG 03 | 00877 | 2023-04-29 09:06:31 |  | WG 03 MPEG-I | Draft registration of Khronos extensions 2nd edition | WG 03 MPEG Systems | |  |  | | --- | --- | | MDS22619\_WG03\_N00877 | A white paper with a black line  Description automatically generated | |
| [MDS22647](https://dms.mpeg.expert/doc_end_user/current_document.php?id=87793&id_meeting=194) | WG 03 | 00904 | 2023-04-29 09:06:31 | 2023-07-16 10:41:32 | WG 03 MPEG-I | Proposed Khronos blog post on MPEG-I Scene Description | WG 03 MPEG Systems | |  |  | | --- | --- | | [MDS22647\_WG03\_N00904](https://dms.mpeg.expert/doc_end_user/documents/142_Antalya/wg11/MDS22647_WG03_N00904.zip) |  | |
| [MDS22679](https://dms.mpeg.expert/doc_end_user/current_document.php?id=87825&id_meeting=194) | WG 03 | 00918 | 2023-04-29 09:06:31 | 2023-05-11 17:15:03 | WG 03 All | Liaison statement to Khronos on MPEG-I Scene Description Status update | WG 03 MPEG Systems | |  | | --- | | [MDS22679\_WG03\_N00918](https://dms.mpeg.expert/doc_end_user/documents/142_Antalya/wg11/MDS22679_WG03_N00918.zip) | |

## Communication from MPEG#143

No communication, but MPEG was invited by Khronos to a meetup that was finally scheduled on July 13, 2023.

Details of the event are here: <https://www.khronos.org/events/gltf-meetup-July2023>

* Public Slides in pdf: [glTF 2.0 Extensions in MPEG and 3GPP - Real time exchange formats for 3D Experiences](https://www.khronos.org/developers/linkto/gltf-2.0-extensions-in-mpeg-and-3gpp-real-time-exchange-formats-for-3d-experiences)
* Video recording: [glTF 2.0 Extensions in MPEG and 3GPP - Real time exchange formats for 3D Experiences](https://www.khronos.org/developers/linkto/gltf-2.0-extensions-in-mpeg-and-3gpp-real-time-exchange-formats-for-3d-experiences-vid)

In addition, Khronos invited to use the presentation and the transcript of the webinar to transfer this into a blog. This effort will happen over the next few weeks and we will share the draft with MPEG colleagues for comments.

## Communication from MPEG#144

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| [MDS23188](https://dms.mpeg.expert/doc_end_user/current_document.php?id=90514&id_meeting=196) | WG 03 | 01035 | 2023-10-20 22:21:23 |  | WG 03 MPEG-I | Draft registration of Khronos extensions 2nd edition | WG 03 MPEG Systems | |  |  | | --- | --- | | MDS23188\_WG03\_N01035 | A white paper with a black line  Description automatically generated | |
| [MDS23221](https://dms.mpeg.expert/doc_end_user/current_document.php?id=90547&id_meeting=196) | WG 03 | 01068 | 2023-10-20 22:21:23 |  | WG 03 MPEG-I | Proposed Khronos blog post on MPEG-I Scene Description | WG 03 MPEG Systems | |  | | --- | | MDS23221\_WG03\_N01068 | |

# Requirements, Scenarios and Test Assets

## Requirements

The work of the MPEG-I scene description is based on the requirements defined in N18965, later revised to N19511. The coverage of the requirements and the progress is documented in

|  |  |  |  |  |  |  |  |  |  |
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| [MDS23203](https://dms.mpeg.expert/doc_end_user/current_document.php?id=90529&id_meeting=196) | WG 03 | 01050 | 2023-10-20 22:21:23 |  | WG 03 MPEG-I | Requirements Coverage of MPEG-I Scene Description | WG 03 MPEG Systems | |  | | --- | | MDS23203\_WG03\_N01050 | |



## Scenarios

Providing Extension to MPEG-I Scene Description is based on well-defined and agreed scenarios. WG3\_N0761 also covers the mapping of requirements to scenarios.

Scenarios include:

* Description of the scenario
* A set of test assets that are needed for the scenario

Agreed scenarios and test assets can be accessed:

* <https://gitlab.com/mpeg-i/scene-description/scenarios/>

Agreed Test Assets can be accessed here.

* <http://mpegfs.int-evry.fr/mpegcontent/ws-mpegcontent/MPEG-I/Part14-SceneDescriptions>

Note: access and contribution to this requires an account. To request an account, please contact the test asset coordinators (see clause 9)

For adding new scenarios, please provide an input contribution to MPEG with the following information

* Description of the scenario
* A set of test assets that are needed for the scenario

A template for the scenario is provided in clause 5.3.

## Template for Test Scenario

The following table should be used to propose test scenarios for scene description:

|  |  |
| --- | --- |
| Item | Description |
| Title | <give it a catchy title, e.g. as those listed in clause 2> |
| Description | * What is the basic use case? * How does it relate to MPEG-I Requirements and Use Cases? |
| Required test assets | * 3D scene, real-time assets for media (2D/3D) * Anything else * References to test assets |
| Current Support | * How can glTF Scene Description be used today * What are gaps/inefficiencies of glTF2.0 to address this scenario? |
| Criteria | * What are relevant criteria for the user experience/QoE? * What are relevant criteria for passing the test scenario? |

## Continuous Call for Test Data

Among others, we solicit the following material to be used as content for the creation and validation of MPEG-Scene Descriptions:

* 2D content that can server as overlays, video textures
* 2D and 3D content that is captured from a local camera, e.g. representing a conference room or flat surfaces for overlay
* 3D game content, e.g. provided in Unity, that can be used for the online gaming scenario
* 3D cinematographic content that includes complete scenes
* VR content and 3D mesh and point cloud content that can be used for VR scenes
* etc…

We welcome contributions of content that can be made available to the MPEG community for the sake of the MPEG-I Scene Description activity.

## Timeline

The data sets should be submitted as input contributions to the 142nd MPEG meeting (April 2023), but early submission into AHG is welcome.

## Available Test Assets

The following table lists the available assets and provides a brief description:

http://mpegx.int-evry.fr/software/MPEG/Systems/SceneDescription/test-assets

# Contributions for Extensions

## General

For every extension documented in ISO/IEC 23090-14 under the framework in clause 3 the following information is expected to be provided:

* The schema for the extension as part of the standard as well as a json document
* The semantics for the extension
* The processing model on the "Presentation Engine"
* The conformance description, i.e. conformance requirements for the Presentation Engine that supports the extension
* *A promise for example content that uses the extension that is finally available within 1 meeting after the technology was added. If not fulfilled, the feature is expected to be removed and this will be documented as a note in the draft standard.*
* *A promise of a reference implementation in one of the agreed reference software libraries as documented in clause 7, that is finally available within 2 meetings after the technology was added. If not fulfilled, the feature is expected to be removed and this will be documented as a note in the draft standard.*

Hence, contributions addressing extensions to glTF under the framework in clause 3 should include the following:

* The scenarios that this extension is addressing. The scenarios are documented in clause **Error! Reference source not found.**.
* All information from above

As long as not all the above information is available, a documented extension is not moved into the WD/CD, but is maintained in the Technology under Consideration (TuC) document. The status of the completed information and the missing one is documented in the TUC.

The following text processes is recommended, but needs final verification:

*To fulfil the requirement on the reference software, it is sufficient to demonstrate that the reference software is able to properly process the test scenario. The test scenario content shall at least have a scene description file in glTF textual format that makes use of the proposed extension. The test scene description glTF document should use one of the available assets. The proposal must indicate any dependencies on other extensions.*

*The following is an example of this procedure:*

* *A test scenario is defined around support for video textures*
* *The proposal is to make use of the MPEG\_video\_texture extension*
* *A sample content is proposed based on the "conferenceroom" glTF file, which is part of the assets. The glTF file is extended to include the MPEG\_video\_texture extension. The bbb.mp4 asset is used to describe the video texture, which is attached to a rectangular mesh in the "conferenceroom" scene.*
* *The reference software is run with the modified scene description document and the expected behavior is demonstrated, showing the video texture.*

## Extension Principles

The following extension principles apply

* If the extension adds a new top-level array (by extending the root glTF object), its elements should inherit all properties of glTFChildOfRootProperty.schema.json.
* Other objects introduced by the extension should inherit all properties of glTFProperty.schema.json.
* By glTF 2.0 conventions, schemas should allow additional properties.
* Names MUST begin with an MPEG prefix, followed by an underscore.
* Names MUST use lowercase snake-case following the prefix, e.g. MPEG\_materials\_sand.
* Names SHOULD be structured as MPEG\_<scope>\_<feature>, where scope is an existing glTF concept (e.g. mesh, texture, image) and feature describes the functionality being added within that scope. This structure is recommended, but not required.
* Scope SHOULD be singular (e.g. mesh, texture), except where this would be inconsistent with an existing Khronos extension (e.g. materials, lights).

# Reference Software

The reference software for the scene description is documented in ISO/IEC 23090-24 as available in :



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| [MDS23199](https://dms.mpeg.expert/doc_end_user/current_document.php?id=90525&id_meeting=196) | WG 03 | 01046 | 2023-10-20 22:21:23 | 2024-01-19 19:16:33 | WG 03 MPEG-I | Potential improvement of ISO/IEC DIS 23090-24 Conformance and reference software for scene description | WG 03 MPEG Systems | |  |  | | --- | --- | | [MDS23199\_WG03\_N01046](https://dms.mpeg.expert/doc_end_user/documents/144_Hannover/wg11/MDS23199_WG03_N01046.zip) |  | |
| [MDS23200](https://dms.mpeg.expert/doc_end_user/current_document.php?id=90526&id_meeting=196) | WG 03 | 01047 | 2023-10-20 22:21:23 | 2024-01-19 19:16:38 | WG 03 MPEG-I | WD of ISO/IEC 23090-24 AMD 1 Conformance and reference software for scene description on haptics, augmented reality, avatars, interactivity and lighting | WG 03 MPEG Systems | |  | | --- | | [MDS23200\_WG03\_N01047](https://dms.mpeg.expert/doc_end_user/documents/144_Hannover/wg11/MDS23200_WG03_N01047.zip) | |

Procedures are documented in WG3 N0848.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| [MDS23171](https://dms.mpeg.expert/doc_end_user/current_document.php?id=90497&id_meeting=196) | WG 03 | 01018 | 2023-10-20 22:21:23 | 2024-01-19 19:16:22 | WG 03 MPEG-I | Procedures for test scenarios and reference software development for MPEG-I Scene Description | WG 03 MPEG Systems | |  | | --- | | [MDS23171\_WG03\_N01018](https://dms.mpeg.expert/doc_end_user/documents/144_Hannover/wg11/MDS23171_WG03_N01018.zip) | |

# Gitlab Management

For details on test assets, conformance and reference software, as well as test scenarios, refer to WG3 N0782. A summary of the assets is provided here:

|  |  |  |
| --- | --- | --- |
| **Asset** | **Hosting** | **Location name** |
| Repository | Gitlab.com | https://gitlab.com/mpeg-i/scene-description |
| MPEG Trimesh (mpegtrimesh) Reference software | Gitlab.com | https://gitlab.com/mpeg-i/scene-description/mpegtrimesh |
| Conformance software | Gitlab.com | https://gitlab.com/mpeg-i/scene-description/conformance |
| Scenarios | Gitlab.com | https://gitlab.com/mpeg-i/scene-description/scenarios |
| Test vectors | Gitlab.com with LFS for binary files | <https://gitlab.com/mpeg-i/scene-description/test-vectors> |
| Test assets | MPEG content | <http://mpegfs.int-evry.fr/mpegcontent/ws-mpegcontent/MPEG-I/Part14-SceneDescriptions> |

For access to the project, please register an account on GitLab.com at <https://gitlab.com/users/sign_in> and collect the following information:

* GitLab.com username
* GitLab.com email address

Please then send an email containing this information to the gitlab managers as listed in clause 9.

For uploading content to the Test Assets, please bring an input contribution to the MPEG meeting.

# Coordinators for Efforts until MPEG#142

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* AHG Chairs:
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  + Mary-Luc Champel ([champelmaryluc@xiaomi.com](mailto:champelmaryluc@xiaomi.com))
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