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ISO/IEC JTC 1/SC 29/WG 4
MPEG VIDEO CODING**

ISO/IEC JTC 1/SC 29/WG 4 m 64710

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Title: [MIV] ASPS MIV edition 2 extension

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Abstract

This proposal proposes syntax and semantics for ISO/IEC 23090-12 *MPEG immersive video 2nd edition* to allow for adding new functionalities which require per atlas or per patch signalling. This proposal has a related WG 7 proposal (m64714).

[ver2 \(incl. suggestions from MIV AhG 2023-09-12\):](#)

- [semantics reordered \(first the flag, then the reserved bits\),](#)
- [clarified syntax structure within the patch margin flag semantics.](#)

1 Introduction

In m63655 and m63656 the VPS and CASPS MIV edition 2 extensions were introduced. In this contribution, we propose to add also the ASPS MIV edition 2 extension. Such an addition will allow to adapt new tools which require per patch signalling (e.g., patch margins: m64165)

The proposed ASPS MIV edition 2 extension is independent on ASPS MIV extension, and it is acceptable to signal both the ASPS MIV extension and the ASPS MIV edition 2 extension.

To prevent a similar problem when adding a flag to a hypothetical third edition of MIV, the proposed extension includes reserved zero bits for future ISO/IEC use.

2 Proposed syntax

8.3.2.10 Atlas sequence parameter set MIV edition 2 extension syntax

| | Descriptor |
|--------------------------------|-------------------|
| asps_miv_2_extension() { | |
| asme_patch_margin_enabled_flag | u(1) |
| asme_reserved_zero_8bits | u(8) |
| } | |

3 Proposed semantics

8.4.2.10 Atlas sequence parameter set MIV 2 extension semantics

asme_patch_margin_enabled_flag equal to 1 indicates that the patch margin parameters are present in the [patch data unit MIV extension](#) syntax structure. asme_patch_margin_enabled_flag

equal to 0 indicates that the patch margin parameters are not present in the [patch data unit MIV extension](#) syntax structure. When not present, the value of `asme_patch_margin_enabled_flag` is inferred to be equal to 0.

`asme_reserved_zero_8bits`, when present, shall be equal to 0 in bitstreams conforming to this version of this document. Other values for `asme_reserved_zero_8bits` are reserved for future use by ISO/IEC. Decoders shall ignore the value of `asme_reserved_zero_8bits`.

4 Proposed profile changes

Table A-1 — Allowable values of syntax element values for the MIV toolset profile components

| Syntax element | Profile name | | | | | | | | | |
|---|---|-------|---|-------|---|-------|---|-------|--------------------------------------|-------|
| | MIV Main | | MIV Extended | | | | | | MIV Geometry Absent | |
| | | | | | Restricted Geometry | | Decoder-Side Depth Estimation | | | |
| | | Still | | Still | | Still | | Still | | Still |
| <code>ptc_one_v3c_frame_only_flag</code> | 0, 1 | 1 | 0, 1 | 1 | 0, 1 | 1 | 0, 1 | 1 | 0, 1 | 1 |
| <code>vuh_unit_type</code> | V3C_VPS, V3C_AD, V3C_GVD, V3C_AVD, or V3C_CAD | | V3C_VPS, V3C_AD, V3C_OVD, V3C_GVD, V3C_AVD, V3C_PVD, or V3C CAD | | V3C_VPS, V3C_AD, V3C_AVD, V3C_PVD, or V3C CAD | | V3C_VPS, V3C_AD, V3C_OVD, V3C_GVD, V3C_AVD, V3C_PVD, or V3C CAD | | V3C_VPS, V3C_AD, V3C_AVD, or V3C CAD | |
| <code>ptl_profile_toolset_idc</code> | 64 | | 65 | | | | | | 66 | |
| <code>ptl_profile_reconstruction_idc</code> | 255 | | 255 | | | | | | 255 | |
| <code>ptc_restricted_geometry_flag</code> | N/A | | 0 | | 1 | | 0 | | N/A | |
| <code>VpsMivExtensionPresentFlag</code> | 1 | | 1 | | 1 | | 0 | | 1 | |
| <code>VpsMiv2ExtensionPresentFlag</code> | 0 | | 0 | | 0 | | 1 | | 0 | |
| <code>VpsPackingInformationPresentFlag</code> | 0 | | 0, 1 | | 0, 1 | | 0, 1 | | 0 | |

| | | | | | |
|---|--------------|------------------------------------|------------------------------------|--------------|--------------|
| vps_map_count_minus1[atlasID] | 0 | 0 | 0 | 0 | 0 |
| vps_auxiliary_video_present_flag[atlasID] | 0 | 0 | 0 | 0 | 0 |
| vps_occupancy_video_present_flag[atlasID] | 0 | 0, 1 | 0 | 0, 1 | 0 |
| vps_geometry_video_present_flag[atlasID] | 1 | 0, 1 | 0 | 0, 1 | 0 |
| vps_packed_video_present_flag[atlasID] | 0 | 0, 1 | 0, 1 | 0, 1 | 0 |
| vme_embedded_occupancy_enabled_flag | 1 | 0, 1 | 0 | 0, 1 | 0 |
| vme_decoder_side_depth_estimation_flag | - | - | - | 1 | - |
| oi_occupancy_msb_align_flag[atlasID] | 0 | 0 | 0 | 0 | 0 |
| gi_geometry_msb_align_flag[atlasID] | 0 | 0 | 0 | 0 | 0 |
| ai_attribute_count[atlasID] | 0, 1 | 0, 1, 2 | 2 | 0, 1 | 1 |
| ai_attribute_type_id[atlasID][attrIdx] | ATTR_TEXTURE | ATTR_TEXTURE, ATTR_TRANSPARENCY | ATTR_TEXTURE, ATTR_TRANSPARENCY | ATTR_TEXTURE | ATTR_TEXTURE |
| ai_attribute_dimension_minus1[atlasID][attrTextureIdx] | 2 | 2 | 2 | 2 | 2 |
| ai_attribute_dimension_minus1[atlasID][attrTransparencyIdx] | N/A | 0 | 0 | N/A | N/A |
| ai_attribute_dimension_partitions_minus1[atlasID][attrIdx] | 0 | 0 | 0 | 0 | 0 |

| | | | | | |
|--|-----|------------------------------------|------------------------------------|--------------|-----|
| ai_attribute_msb_align_flag[atlasID][attrIdx] | 0 | 0 | 0 | 0 | 0 |
| pin_attribute_count[atlasID] | N/A | 0, 1, 2 | 2 | 0, 1 | N/A |
| pin_attribute_type_id[atlasID][attrIdx] | N/A | ATTR_TEXTURE, ATTR_TRANSPARENCY | ATTR_TEXTURE, ATTR_TRANSPARENCY | ATTR_TEXTURE | N/A |
| pin_attribute_dimension_minus1[atlasID] [attrTextureIdx] | N/A | 2 | 2 | 2 | N/A |
| pin_attribute_dimension_minus1[atlasID] [attrTransparencyIdx] | N/A | 0 | 0 | N/A | N/A |
| pin_attribute_dimension_partitions_minus1[atlasID] [attrIdx] | N/A | 0 | 0 | 0 | N/A |
| pin_attribute_msb_align_flag[atlasID][attrIdx] | N/A | 0 | 0 | 0 | N/A |
| casps_miv_2_extension_present_flag | 0 | 0 | 0 | 1 | 0 |
| casps_miv_2_extension_present_flag | 0 | 0 | 0 | 1 | 0 |
| asps_max_dec_atlas_frame_buffering_minus1 | 0 | 0 | 0 | 0 | 0 |
| asps_long_term_ref_atlas_frames_flag | 0 | 0 | 0 | 0 | 0 |
| asps_pixel_deinterleaving_enabled_flag | 0 | 0 | 0 | 0 | 0 |
| asps_patch_precedence_order_flag | 0 | 0 | 0 | 0 | 0 |
| asps_raw_patch_enabled_flag | 0 | 0 | 0 | 0 | 0 |

| | | | | | |
|--|------------------|------------------|------------------|------------------|------------------|
| asps_eom_patch_enabled_flag | 0 | 0 | 0 | 0 | 0 |
| asps_plr_enabled_flag | 0 | 0 | 0 | 0 | 0 |
| asps_vpcc_extension_present_flag | 0 | 0 | 0 | 0 | 0 |
| asme_patch_constant_depth_flag | 0 | 0, 1 | 1 | 0 | 0 |
| vps_geometry_video_present_flag[atlasID] pin_geometry_present_flag[atlasID] asme_patch_constant_depth_flag | N/A | 1 | 1 | 0, 1 | N/A |
| afps_lod_mode_enabled_flag | 0 | 0 | 0 | 0 | 0 |
| afps_raw_3d_offset_bit_count_explicit_mode_flag | 0 | 0 | 0 | 0 | 0 |
| afti_single_tile_in_atlas_frame_flag | 1 | 0, 1 | 0, 1 | 0, 1 | 0, 1 |
| dq_quantization_law[v] | 0 | 0 | 0 | 0 | 0 |
| ath_type | I_TILE | I_TILE | I_TILE | I_TILE | I_TILE |
| atdu_patch_mode[tileID][patchIdx] | I_INTRA | I_INTRA | I_INTRA | I_INTRA | I_INTRA |
| aaps_vpcc_extension_present_flag | 0 | 0 | 0 | 0 | 0 |
| asps_atlas_sequence_parameter_set_id | 0..63, inclusive | 0..63, inclusive | 0..63, inclusive | 0..63, inclusive | 0..63, inclusive |
| afps_atlas_frame_parameter_set_id | 0..63, inclusive | 0..63, inclusive | 0..63, inclusive | 0..63, inclusive | 0..63, inclusive |
| afps_atlas_sequence_parameter_set_id | 0..63, inclusive | 0..63, inclusive | 0..63, inclusive | 0..63, inclusive | 0..63, inclusive |

5 Conclusions

The proponent recommends:

- Recommend to WG 7 to adopt the related proposal [m64714].
- Adopt this proposal conditional on the adoption of the WG 7 proposal.

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