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**ISO/IEC JTC1/SC29/WG11 MPEG2016/M50857**

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# Introduction

Version "d40\_withProfiles" of the V-PCC draft specification [1], Enhanced Occupancy Map mode is excluded from the basic profile (asps\_enhanced\_occupancy\_map\_for\_depth\_flag forced to 0) but present in the Full (or Advanced) profile. It was asserted that, when present, EOM (attributes) patch requires additional syntax parsing and additional image decoding (the portion of the attribute frame containing the EOM attributes) although one decoder would not consider EOM coded points for reconstruction i.e. without consideration for the optional conformance point B.

This contribution proposes EOM constraints to address said decoding concern.

# Proposal

It is allegedly claimed that EOM is a tool particularly competitive when it comes to carry the original point cloud as only one map/layer (with EOM activated) against two maps/layers.

Typically, considering current implementation of the V-PCC codec (TMC2 v7), it is claimed that one layer/map is easier to decode by current terminals than two layers/maps. In case, a content provider would be interested in providing a faithful to the original point cloud (preserving artistic intent) or a high quality (high bitrate or lossless) reconstructed point cloud with only one layer, EOM provides significant bitrate gains (see Result section 3). Consequently, EOM may be a tool of interest for implementation of 1 map/layer configuration as 1 layer/map is currently premitted by the Basic profile.

The intent of this proposal is to provide a set of restrictions on syntax elements that may allow enabling EOM with Basic profile -- conformance point A -- when it is combined with Rec1 and possibly Rec Unconstrained reconstruction profiles component (still disallowing the tool with Rec0) -- conformance point B -- while addressing technical comment. Proposed restrictions result in placing EOM attributes in a separate video which may be discarded by the V-PCC decoder (typically for the profile V-PCC Basic Rec Unconstrained). It is noted that, by design, in case of EOM presence, the decoding of geometry is not impacted compared to its non presence as the occupancy map is required to be decoded anyway.

The proposition consists of one constraint release and two restrictions:

- remove asps\_enhanced\_occupancy\_map\_for\_depth\_flag = 0 from table A.4, so that EOM may be permitted with Basic profile in conjunction with Rec1 and possibly Rec Unconstrained.

- set to 1 the value of vpcc\_raw\_separate\_video\_present\_flag in table A.4, conditionnaly to vpcc\_raw\_patch\_enabled\_flag presence (discrepency between V-PCC draft specification and reference software - see contribution [2] to understand why this flag actually acts upon EOM separate video mode)

- set to 1 the value of epdu\_patch\_in\_eom\_video\_flag if it exists (or currently rpdu\_patch\_in\_raw\_video\_flag) (see [2] for clarifications)

It is worth noting that levels also limit EOM mode usage as specified in table A.8 of [1].

# Results

In this clause, one layer is compared to one layer with EOM in lossless conditions. The average bitrate gain reported is 16.80%.

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | **r7\_1\_1L\_10b\_EOM1\_sep0** | |
|  |  | Bitrate | TotBits |
| Average Gain | | -101691,16 | -3171320,6 |
| Anchor | | 604638,53 | 18873190 |
| Gain | | -16,82% | -16,80% |
|  | |  |  |

# References

[1] Draft V-PCC specification, CD stage, revision d40

[2] m50860, On separate video for EOM/raw modes, P. Andrivon et al, MPEG128, Geneva