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| *Title:* | **On AVC base layer coding structure indication** | | |
| *Status:* | Input Document | | |
| *Purpose:* | Proposal | | |
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# Abstract

It is proposed to add an identical GOP structure indicator for the AVC base scalability to indicate if the AVC base layer GOP structure is the same as the GOP structure of the enhancement layers. The benefit of such indicator is to inform the decoder if all the pictures associated with the same output time can be decoded consecutively or not, and further facilitate the decoding initialization and memory allocation.

# Introduction

HEVC specifies the reference picture set (RPS) to indicate the GOP prediction structure, and such RPS is signaled in sequence parameter set (SPS). However, AVC does not have such GOP structure indication and the GOP prediction structure can only be obtained after decoding one GOP of pictures. For AVC base standard scalability application, it would be benefit to indicate if the HEVC enhancement layers and AVC base layer share the same GOP prediction structure or not. If AVC base and HEVC enhancement layers share the same GOP structure, the decoder could decode all the pictures associated with the same output time synchronically and no extra memory are needed. If the GOP structure between AVC base and HEVC enhancement layers are different, the relative decoding initialization and memory allocation may be needed due to different decoding order.

Figure 1 shows an unequal BL and EL GOP length example proposed in [1] where the decoding order of base layer and enhancement layers is different. The decoding order is ..., B4, B2, B1, B3, B8, E8, E4, E2, E1, E3, B6, E6, B5, E5, B7, E7, ... The additional DPB memory use is equal to 2 BL pictures (B1, B3) when compared to using the same GOP length (4) in both BL and EL. In addition, the pictures with the same POC value cannot be decoded consecutively in such scenario.



1. Unequal AVC BL and HEVC EL GOP length

To indicate if the GOP coding structure is identical among all layers to facilitate the decoding initialization, an identical GOP coding structure indicator is proposed to add in VPS extension.

Table 1 shows the proposed indicator flag signaled in the VPS extension.

1. Proposed Video parameter set extension syntax

|  |  |
| --- | --- |
| vps\_extension( ) { | Descriptor |
| while( !byte\_aligned( ) ) |  |
| **vps\_extension\_byte\_alignment\_reserved\_one\_bit** | u(1) |
| **avc\_base\_layer\_flag** | u(1) |
| if (avc\_base\_layer\_flag) |  |
| avc\_identical\_coding\_structure\_flag | u(1) |
| **splitting\_flag** | u(1) |
| ... |  |
| } |  |

**avc\_identical\_coding\_structure\_flag** equal to 1 specifies that the short and long term temporal reference pictures of all coded pictures in the base layer are co-located with all short term and long term reference pictures of all co-located pictures in the enhancement layers. avc\_identical\_coding\_structure\_flag equal to 0 indicates that the short and long term temporal reference pictures of all coded pictures in the base layer are not co-located with all short term and long term reference pictures of all co-located pictures in the enhancement layers. avc\_identical\_coding\_structure\_flag is inferred to 1 when it is not present.

# Reference

1. JCTVC-L0171, SHVC HLS: support for unequal BL and EL GOP lengths, January 2013

# Patent rights declaration(s)

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