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| *Title:* | **On maximum number of direct and indirect reference layers in the 3D-HEVC main profile** | | |
| *Status:* | Input Document | | |
| *Purpose:* | Proposal | | |
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# Abstract

The second version (v2) of the document additionally includes specification text reflecting the changes suggested in JCT-3V.

It is proposed to align the maximum number direct and indirect reference layers, which has been inherited from MV-HEVC, to meet requirements of 3D-HEVC.

# Problem statement

The 3D main profile imposes the following constraint:

* For a layer with nuh\_layer\_id iNuhLId equal to any value included in layerIdListTarget that was used to derive subBitstream, the value of NumRefLayers[ iNuhLId ], which specifies the total number of direct and indirect dependent layers and is derived as specified in F.7.4.3.1, shall be less than or equal to 4.

However, since texture in 3D-HEVC can additionally depend on depths layers, and vice versa, the number of direct and indirect reference layers is typically increased compared to MV-HEVC, such that the number 4 is not sufficient in common use cases.

**Example**: Consider the following IBP scenario

* 3 views with view order indices 0, 1, and 2
* texture and depth for each view
* texture of view 2 depends the textures view 0 and 1
* depth of view 2 depends the depth view 0 and 1

Thus, in MV-HEVC (with depth layers being auxiliary picture layers) the number of direct and indirect reference layers of the depth of view 2 would be 2.

However, assuming 3D-HEVC with an additional dependency of depth of view 2 from texture of view 2 (e.g. MPI), the number of direct and indirect reference layers of the depth of view 2 would be equal to 5, and thus already exceed the current 3D main profile limit.

# Proposed solution

It is proposed to set the total number of direct and indirect dependent layers to 4 \* 2 + 1 = 9. This way a potential dependency from a layer of a different component is regarded for each direct and indirect reference layer of the current layer and the current layer itself.

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