3GPP TSG-SA WG4 Meeting #133-eS4-251398r01

Online, 18 – 25 July 2025

**Source: Xiaomi**

**Title: Pseudo-CR on Clarifications of bitstream constraints rules**

**Spec: 3GPP TS 26.265**

**Agenda item: 9.5**

**Document for: Decision**

**1. Introduction**

When developing the bitstream validation software, it appeared that some bitstream constraints should be clarified.

The summary of changes is as follow:

- Change #1: (4.5.3 HEVC Bitstreams)

The sentence “All parameters shall remain the same for the entire bitstream” is not clear to what it pertains. Our interpretation is that it relates to the parameter of the frame packing arrangement SEI message.

As a result, we propose the text change of clarification the scope and fixing the ident of the bullet.

- Change #2: (6.3.6.2 Bitstream Requirements, 3GPP MV-HEVC Stereo Operation Point )

The current text requires certain values in the VPS but the VPS is not required in the bitstream. If this is the intent, we should mandate its presence.

Additionally, the current text does not specify the maximum number of layers that can be present in the bitstream. It merely requires at least two layers as the text implies. For clarity, it would be better to set the maximum number of layer to two layers.

**2. Reason for Change**

The proposed changes removes ambiguity in terms of bitstream structure.

**3. Conclusions**

In order to avoid fragmentation of bitstreams declaring compliancy against TS 26.265, it is essential to avoid any room for interpretation for the reader when generating and consuming bitstreams.

**4. Proposal**

It is proposed to agree the following changes to 3GPP TS 26.265 1.2.0

\* \* \* First Change \* \* \* \*

### 4.5.3 HEVC Bitstreams

The following definitions are provided for HEVC/ITU-T H.265 [h265] bitstreams.

For an HEVC/ITU-T H.265 [h265] bitstream, *progressive constraints* are defined that the following flags in the active Sequence Parameter Set (SPS):

 - general\_progressive\_source\_flag shall be set to 1,

- general interlaced\_source\_flag shall be set to 0,

- general\_non\_packed\_constraint\_flag shall be set to 1, and

- general\_frame\_only\_constraint\_flag shall be set to 1.

For an HEVC/ITU-T H.265 [h265] bitstream, *VUI constraints* are defined:

- Video Parameter Sets (VPS) NAL units as defined in Recommendation ITU-T H.265 / ISO/IEC 23008-2 [h265] may be present, but the Bitstream shall be valid if the Receiver ignores the VPS.

- The Video Usability Information (VUI) is present in the active Sequence Parameter Set, i.e. the vui\_parameters\_present\_flag shall be set to 1.

- In the VUI,

- the aspect ratio information is present, i.e. the aspect\_ratio\_info\_present\_flag value shall be set to 1,

- the colour parameter information is present, i.e. video\_signal\_type\_present\_flag value shall be set to 1 and the colour\_description\_present\_flag value shall be set to 1.

- only video range signals are used, i.e. the video\_full\_range\_flag shall be set to 0,

- no overscan signalling is present, i.e. the overscan\_info\_present\_flag shall be set to 0,

- the chroma location shall be signalled, i.e. chroma\_loc\_info\_present\_flag shall be set to 1,

- the timing information may be present. If the timing information is present, i.e. the value of vui\_timing\_info\_present\_flag is set to 1, then the values of vui\_num\_units\_in\_tick and vui\_time\_scale shall be set according to the frame rates allowed for each operation point. The timing information present in the video Bitstream should be consistent with the timing information signalled at the system level. The frame rate shall not change between two RAPs. fixed\_frame\_rate\_flag value, if present, shall be set to 1.

[For an HEVC/ITU-T H.265 [h265] bitstream, *frame-packing constraints* are defined:

- the following flags in the active Sequence Parameter Set (SPS):

 - general\_progressive\_source\_flag shall be set to 1,

- general interlaced\_source\_flag shall be set to 0,

- general\_non\_packed\_constraint\_flag shall be set to 0, and

- general\_frame\_only\_constraint\_flag shall be set to 1.

- The frame packing arrangement SEI message shall be present with the following characteristics:

- The value of frame\_packing\_arrangement\_type shall be set to either the value of 3 for the side-by-side packing arrangement, or the value of 4 for the top-bottom/over-under packing arrangement.

- The value of quincunx\_sampling\_flag shall be set to 0.

- The value of content\_interpretation\_type shall be set to either 1 or 2.

- The value of spatial\_flipping\_flag shall be set to 0.

- The value of frame0\_flipped\_flag shall be set to 0.

- The value of field\_views\_flag shall be set to 0.

- The value of current\_frame\_is\_frame0\_flag shall be set to 0.

- The values of frame0\_grid\_position\_x, frame0\_grid\_position\_y, frame1\_grid\_position\_x, and frame1\_grid\_position\_y, shall remain the same throughout the bitstream.

- The value of upsampled\_aspect\_ratio\_flag shall be set to 0, indicating the presence of full resolution frame packed video and the aspect\_ratio\_idc shall be set to 1.

 - All parameters of the frame packing arrangement SEI message shall remain the same for the entire bitstream.

\* \* \* Next Change \* \* \* \*

6.3.6.2 Bitstream Requirements

Editor’s Note: this needs additional signaling:

* Layer dependency is possible, but not needed. Can be two independent layers, inter-layer prediction can be supported in this video coding capability.
* 3D reference displays information SEI message

A 3GPP-MV-HEVC-Stereo Bitstream shall conform to the following requirements

- the Representation Format included in the Bitstream shall conform to the 3GPP Stereoscopic format as defined in clause 4.4.3.4.

- The bitstream shall conform to the constraints specified in the **MV-HEVC-UHD** decoding capabilities as defined in clause 5.3.2.

- the Bitstream shall be decodable by

- a decoder with **HEVC-UHD-Dec** decoding capabilities as defined in clause 5.3.2.

- a decoder with **MV-HEVC-UHD** decoding capabilities as defined in clause 5.3.2.

- The chroma sub-sampling shall be 4:2:0 and the value of chroma\_format\_idc shall be set to 1.

- The vps\_max\_layers\_minus1 shall be set to 1.

- AuxId[ lId ] shall be equal to 0 in the VPS extension for the sub-bitstream with nuh\_layer\_id != 0.

Editor’s Note: this should refer to the bitstream element and not the variable AuxId.

- The aspect\_ratio\_idc value shall be set to 1, indicating a square pixel format.

- In the VUI, either

- the values of colour\_primaries, transfer\_characteristics and matrix\_coeffs each shall be set to 1.

- The value of chroma\_sample\_loc\_type\_top\_field shall be set to 0.

- or

- the values of colour\_primaries and matrix\_coeffs each shall be set to 9, and the value of transfer\_characteristics shall be set to one of the following values: 14 (for SDR with WCG), 16 (for PQ) and 18 (for HLG).

- The value of the chroma\_sample\_loc\_type\_top\_field shall be set to 2.

The timing information may be present.

- If the timing information is present, i.e. the value of vui\_timing\_info\_present\_flag is set to 1, then the values of vui\_num\_units\_in\_tick and vui\_time\_scale shall be set according to the frame rates allowed for each operation point. The timing information present in the video Bitstream should be consistent with the timing information signalled at the system level.

- The frame rate shall not change between two RAPs. fixed\_pic\_rate\_general\_flag value, if present, shall be set to 1.

Bitstreams not required to be associated with frame packing information for all coded video sequences. It is also possible that such information, when present, may differ from one coded video sequence to another.

VPS NAL units may be present in the bitstream or conveyed by other means. If conveyed by other means, the Recommendation ITU-T H.265 / ISO/IEC 23008-2 [h265] requires the VPS NAL units to be available to the decoding process in a timely fashion .

\* \* \* End of Changes \* \* \* \*