**3GPP TSG SA4 Meeting #113e** **TD S4-210608**

## 6-14 April 2020 revision of SP-200667

**Source: Intel, NHK, Ericsson LM, AT&T, Qualcomm Incorporated, Dolby Laboratories Inc., Beijing Xiaomi Electronics, Tencent, Huawei Technologies Co Ltd.**

**Title: New Work Item on “Operation Points for 8K VR 360 Video over 5G”**

**Document for: Agreement**

**Agenda Item: 11.5**

3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](http://www.3gpp.org/About/WP.htm), article 39; and [3GPP TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm).
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

# Title: Operation Points for 8K VR 360 Video over 5G

## Acronym: 8K\_VR\_5G

## Unique identifier: 890009

## 1 Impacts

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Affects:** | UICC apps | ME | AN | CN | Others (specify) |
| **Yes** |  | X |  | X |  |
| **No** | X |  | X |  | X |
| **Don't know** |  |  |  |  |  |

## 2 Classification of the Work Item and linked work items

### 2.1 Primary classification

This work item is a

|  |  |
| --- | --- |
| X | Feature |
|  | Building Block |
|  | *Work Task* |
|  | Study Item |

### 2.2 Parent and child Work Items

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| --- |
| Parent and child Work Items  |
| Unique ID | Title | Nature of relationship |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

### 2.3 Other related Work Items and dependencies

|  |
| --- |
| Other related Work Items (if any) |
| Unique ID | Title | Nature of relationship |
| 810006 | Study on eXtended Reality (XR) in 5G | Term ‘presence’ has been defined in TR 26.928, stressing the need for improved spatial and temporal resolutions allow to bring VR experiences closer to the experience of being “present |
|  |  |  |
|  |  |  |
|  |  |  |

## 3 Justification

Since the development of 360-degree video profiles for VR streaming defined in TS 26.118, mobile device capabilities have improved and nowadays they support higher decoding capabilities. In particular, the new 5G mobile devices (e.g., phones and head-mounted displays) entering the market in 2020 and beyond are expected to support up to 8K video decoding capabilities.

In TR 26.928, the importance of better video quality has been stressed and the term “presence” has been defined. Improved spatial and temporal resolutions allow to bring VR experiences closer to the experience of being “present”.

Also, 360-degree video profiles for VR streaming defined in TS 26.118 also currently rely on client decoding capabilities based on support for H.264/AVC Progressive High Profile Level 5.1 and H.265/HEVC Main-10 Profile Main Tier Profile Level 5.1 corresponding to distribution formats up to 4K resolutions and hence do not include any operation points to support 8K video distribution. Likewise, 8K decoding capabilities are also currently lacking in 5G Media Streaming (5GMS) as defined in TS 26.511.

Note that Flexible H.265/HEVC operation point in TS 26.118 may be applicable with 8K original content spatial resolutions, but this relies on the Advanced Video Profile (e.g., with tile-based streaming) while no operation points supporting for 8K video distribution are currently defined for the Main Video Profile that is defined in conjunction with the Main H.265/HEVC operation point. Use of the Main Video Profile together with a new operation point for 8K video distribution can deliver the same resolution per eye as that of the combination of Flexible H.265/HEVC operation point and Advanced Video Profile, while avoiding the complexities and costs associated with viewport-dependent processing and using off the shelf components such as legacy DASH clients that have already a very wide industry support, facilitating easier deployment on the encoder, streaming and player sides.

In addition, in particular for live workflows, HDR-based VR services may use Hybrid-Log-Gamma transfer functions. This addition is expected as part of the work item.

## 4 Objective

The objective of this Work Item is to specify operation points in VR streaming specification TS 26.118 as well as new media decoding capabilities for 5GMS in TS 26.511 in order to enable support for up to 8K video.

More specifically, this work item aims to conduct the following normative work in TS 26.118 and TS 26.511, toward fulfilling this objective:

- Define new 360-degree video operation point(s) for VR streaming to be used in conjunction with the Main Video Profile with conforming bitstream requirement based on H.265/HEVC Main-10 Profile Main Tier Profile beyond the existing level 5.1 decoding capability, supporting spatial resolutions up to 8K as well as frame rates up to 120fps.

- Define Hybrid-Log-Gamma based HDR for Flexibe Operation Point and 8K Operation Point.

- Provide implementation guidelines for deploying such new profiles and operation points.

- Include the newly defined decoding capabilities and associated profiles and operation points into 5G Media Streaming.

- Document typical traffic characteristics of such 8K VR 360 video services.

## 5 Expected Output and Time scale

|  |
| --- |
| **New specifications** *{One line per specification. Create/delete lines as needed}* |
| Type  | Series | Title | For info at TSG#  | For approval at TSG# | Remarks |
|  |  |  |  |  |  |

|  |
| --- |
| **Impacted existing TS/TR** *{One line per specification. Create/delete lines as needed}* |
| TS/TR No. | Description of change  | Target completion plenary# |
| *TS 26.118* | Operation Points for 8K VR 360 Video over 5G (Rel-17) | SA#91 (Mar 2021) |
| *TS 26.511* | Decoding Capabilities and Operation Points for 8K VR 360 Video over 5G (Rel-17) | SA#91 (Mar 2021) |
| *TS 26.118* | Support for Hybrid Log Gamma in VR (Rel-17) | SA#92 (Jun 2021) |
| *TR 26.925* | Typical traffic characteristics for for 8K VR 360 Video over 5G 5G (Rel-17) | SA#92 (Jun 2021) |

## 6 Work item Rapporteur(s)

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## 7 Work item leadership

*SA4*

## 8 Aspects that involve other WGs

## 9 Supporting Individual Members

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| --- |
| Supporting IM name |
| Intel |
| NHK |
| Ericsson LM |
| AT&T |
| Qualcomm Incorporated |
| Dolby Laboratories Inc. |
| Beijing Xiaomi Electronics |
| Tencent |
| Huawei Technologies Co Ltd. |
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