**Source: Samsung Electronics, CO., LTD**

**Title: [iRTCW] Updates on media capability**

**Agenda Item: 10.5**

**Document for: Discussion and Agreement**

1. **Introduction**

During RTC SWG telco#14, it was agreed to work on drafting a new TS for RTC media capability and S4aR230120 as a baseline document for further works. The current baseline document was based on the references to those of 5GMS in TS 26.511, but during the telco, it was raised that RTC also should rely on 26.114.

This input contains the brief summary of media capabilities and profiles for both 5GMS and MTSI and proposed text to S4aR230120.

1. **Discussion**

The table below shows the list of mandatory/recommended codec profiles for 5GMS and MTSI.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | MTSI | 5GMS Downlink | 5GMS Uplink |
| Video | AVC | Constrained BP Lv1.2  Constrained HP Lv4.0 | Progressive HP Lv3.1 (HD)  Progressive HP Lv4.0 (FullHD) |  |
| HEVC | Main Profile, Main Tier, Lv3.1  Main Profile, Main Tier, Lv4.0 | Main Profile, Main Tier, Lv3.1 (HD)  Main10 Profile, Main Tier, Lv4.1 (FullHD) | Main10 Profile, Main Tier, Lv4.1 (FullHD) |
| Speech | | AMR  AMR-WB (Wideband)  EVS (SWB, FB) | AMR (8KHz)  AMR-WB (16KHz)  EVS (8, 16, 32, 48KHz) | AMR (8KHz)  AMR-WB (16KHz)  EVS (8, 16, 32, 48KHz) |
| Audio | |  | eAAC+ stereo (32, 44.1, 48KHz)  AMR-WB+ (8, 16, 32, 48KHz)  xHE-AAC stereo (32, 44.1, 48KHz) | eAAC+ stereo (32, 44.1, 48KHz)  xHE-AC stereo (32, 44.1, 48KHz) |

NOTE) Green : shall statement

Yellow : should statement

Cyan : may statement

NOTE) All the codec profiles in the table are for the sake of brevity. Details should refer to 26.114 and 26.511

There may be no reason not to have the same list for uni-directional RTC profile (Send/Receive-only) with 5GMS DL/UL respectively. For bi-directional RTC profile (Send-receive), it is also reasonable to refer to MTSI as the similar nature of service scenario for the consistency. Here is some thoughts how to merge MTSI and 5GMS codecs for Send-receive profile;

* For AVC, MTSI mandated Constrained Baseline Profile Lv1.2 for lost-cost applications, but it may not be required to be included in RTC due to extremely low resolution support (e.g., 320x240).
* For AVC, Constrained HP Lv4.0 (in MTSI) and Progressive HP Lv4.0 (in 5GMS DL) seem a bit duplicated and need to select one of them.
* For HEVC, Main10 Profile Lv4.1 (in 5GMS DL) may cover Main Profile Lv4.0 (in MTSI), but it is also acceptable to have both.
* Speech and Audio codecs in 5GMS fully cover those in MTSI.

With those observations, here is the proposed list for RTC profiles.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | Send-receive |  |  |
| Video | AVC | Progressive HP Lv3.1 (HD)  Progressive HP Lv4.0 (FullHD) |  |  |
| HEVC | Main Profile, Main Tier, Lv3.1  Main Profile, Main Tier, Lv4.0  Main10 Profile, Main Tier, Lv4.1 (FullHD) |  |  |
| Speech | | AMR (8KHz)  AMR-WB (16KHz)  EVS (8, 16, 32, 48KHz) |  |  |
| Audio | | eAAC+ stereo (32, 44.1, 48KHz)  AMR-WB+ (8, 16, 32, 48KHz)  xHE-AAC stereo (32, 44.1, 48KHz) |  |  |

1. **Proposed text change to S4aR230120 (baseline draft TS)**

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| --- |
| **First Change** |

[x] Recommendation ITU-T H.265: "High efficiency video coding" | ISO/IEC 23008-2:2020: "High Efficiency Coding and Media Delivery in Heterogeneous Environments – Part 2: High Efficiency Video Coding". [120] IETF RFC 7798 (2016): "RTP Payload Format for High Efficiency Video Coding (HEVC)", Y.-K. Wang, Y. Sanchez, T. Schierl, S. Wenger, M. M. Hannuksela.

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| **Second Change** |

4.2 Video

4.2.1 H.264 (AVC)

4.2.1.1 Decoding

The following H.264 (AVC) media decoding capabilities are defined:

- **AVC-HD-Dec:** the capability as defined in 3GPP TS 26.511 [2] clause 4.2.1.1.

- **AVC-FullHD-Dec:** the capability as defined in 3GPP TS 26.511 [2] clause 4.2.1.1.

4.2.1.2 Encoding

The following H.264 (AVC) media encoding capabilities are defined:

- **AVC-HD-Enc:** the capability as defined in 3GPP TS 26.511 [2] clause 4.2.1.2.

- **AVC-FullHD-Enc:** the capability as defined in 3GPP TS 26.511 [2] clause 4.2.1.2.

4.2.2 H.265 (HEVC)

4.2.2.1 Decoding

The following H.265 (HEVC) media decoding capabilities are defined:

- **HEVC-HD-Dec**: the capability as defined in 3GPP TS 26.511 [2] clause 4.2.2.1.

- **HEVC8-FullHD-Dec**: the capability to decode H.265 (HEVC) Main Profile, Main Tier, Level 4.0 [x] as defined in 3GPP TS 26.114.

- **HEVC-FullHD-Dec**: the capability as defined in 3GPP TS 26.511 [2] clause 4.2.2.1.

4.2.2.2 Encoding

The following H.265 (HEVC) media encoding capabilities are defined:

- **HEVC-HD-Enc**: the capability as defined in 3GPP TS 26.511 [2] clause 4.2.2.2.

- **HEVC8-FullHD-Enc**: the capability to encode a video signal with

- up to 66,846,720 luma samples per second;

- up to a luma picture size of 2,228,224 samples;

- up to 240 frames per second;

- the Chroma format being 4:2:0; and

- the bit depth being either 8 bit;

to a bitstream that is decodable by a decoder that is **HEVC8-FullHD-Dec** capable as defined in clause 4.2.2.1.

- **HEVC-FullHD-Enc**: the capability as defined in 3GPP TS 26.511 [2] clause 4.2.2.2.

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| **Third Change** |

5.2 Send-receive RTC profile

5.2.1 Introduction

This profile defines required capabilities for RTC client functionalities in case of communicating with remote RTC client in UE. Requirements for the following functions are defined in this clause:

- Media Encapsulation FIand Decapsulation

- Media Encryption and Decryption

- Media Encoding and Decoding

5.2.2 Video decoding

If the RTC client supports the reception of video, then

**- AVC-HD-Dec** decoding capability shall be supported as defined in clause 4.2.1.1.

**- HEVC8-HD-Dec** decoding capability should be supported as defined in clause 4.2.2.1.

- **HEVC-HD-Dec** decoding capability should be supported as defined in clause 4.2.2.1.

If the RTC client supports the reception of video and HD-HDR capabilities, then:

- **AVC-FullHD-Dec** decoding capability shall be supported as defined in clause 4.2.1.1.

- **HEVC8-FullHD-Dec** decoding capability shall be supported as defined in clause 4.2.2.1.

- **HEVC-FullHD-Dec** decoding capability shall be supported as defined in clause 4.2.2.1.

5.2.3 Audio decoding

If the RTC client supports the reception of audio:

- **xHE-AAC stereo** decoding capability should be supported as defined in 3GPP TS 26.117 [4] clause 5.2.

NOTE: xHE-AAC® is a registered trademark of Fraunhofer in Germany and other countries and is used with Fraunhofer’s permission.

- **eAAC+** decoding capability shall be supported as defined in 3GPP TS 26.117 [4] clause 5.2.

- **AMR-WB+** decoding capability may be supported as defined in 3GPP TS 26.117 [4] clause 5.2.

5.2.4 Speech decoding

If the RTC client supports the reception of speech:

- the **EVS** decoding capability shall be supported as defined in 3GPP TS 26.117 [4] clause 5.2.

**-** the **AMR-WB** decoding capability should be supported as defined in 3GPP TS 26.117 [4] clause 5.2.

- the **AMR** decoding capability may be supported as defined in 3GPP TS 26.117 [4] clause 5.2.

5.2.5 Decapsulation and Decryption

Editor’s NOTE: will refer to clause 4.6 and 4.7 in this document

5.2.6 Video encoding

If the RTC client supports the transmission of video:

- the real-time encoding capabilities for **HEVC-FullHD-Enc** as defined in clause 4.2.2.2 defined as the sender requirements for **HEVC-FullHD-Enc** Operation Point shall be supported.

5.2.7 Audio encoding

If the RTC client supports the transmission of audio:

- the sender requirements for the **eAAC+ stereo** Operation Point as defined in 3GPP TS 26.117 [4] clause 6.3.2.3 shall be supported.

- the sender requirements for the **xHE-AAC stereo** Operation Point as defined in 3GPP TS 26.117 [4] clause 6.3.4.3 should be supported.

5.2.8 Speech encoding

If the RTC client supports the transmission of speech:

- the sender requirements for the EVS Operation Point as defined in 3GPP TS 26.117 [4] clause 6.2.4.3 shall be supported;

- the sender requirements for the AMR-WB Operation Point as defined in 3GPP TS 26.117 [4] clause 6.2.3.3 should be supported;

- the sender requirements for the AMR Operation Point as defined in 3GPP TS 26.117 [4] clause 6.2.2.3 may be supported.

5.2.9 Encapsulation and Encryption

Editor’s NOTE: will refer to clause 4.6 and 4.7 in this document

5.2.10 Capability discovery

Editor’s NOTE: This clause will address how to identify supportable media profile in Native WebRTC Application. It should go along with RTC-7 API which will be defined in TS 26.113.