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| Agenda Item: | 11.9 |
| Source: | **Fraunhofer HHI** |
| Title: | **[5G\_STAR] 5GMS Immersive downlink streaming procedures for EDGAR UEs** |
| Document for: | **Discussion and agreement** |

1. **Introduction**

During the SA4#112e-meetings, text for section 6.2.4 (Procedures and call flows for STAR-based 5GMS Downlink) was agreed and added to the TR 26.998. Based on the agreed text similar call flows and procedures are provided for EDGAR-based 5GMS Downlink.

The procedures #1-#4, #16, #17, #20-#23 are new compared to the procedures in 6.2.4.

It is proposed to add the following to the Permanent Document.

1. **Proposal**

\*\*\* Change 1 \*\*\*

#### 6.2.4.1 STAR-based

[Current text in 6.2.4]

#### 6.2.4.2 EDGAR-based

Note: This procedure below needs to be aligned with FS\_EMSA work.

Figure 6.2.4 illustrates the procedure diagram for 5G immersive media downlink streaming using a EDGAR-based UE.



Figure 6.2.4: EDGAR-based 5GMS Downlink Procedure

Prerequisites:

- AR/MR Application Provider has established a Provisioning Session and its detailed configurations has been exchanged.

- AR/MR Application Provider has completed to set up ingesting immersive contents.

Procedures:

1. Edge Computing provisioning phase as described in TR 26.803.

2. 5GMS Application Provider Provisioning phase as described in TR 26.803.

2a. Optional 5GMS Application Provider Provisioning phase as described in TR 26.803.

3. UE Edge Computing Discovery phase as described in TR 26.803.

3a. Optional 5GMS Application Provider Provisioning phase as described in TR 26.803.

4. The 5GMS Session phase starts as described in TR 26.803 with further steps below.

5. Service Announcement is triggered by AR/MR Application. Service Access Information including Media Player Entry or a reference to the Service Access Information is provided through M8d interface.

6. Desired media content is selected.

7. AR/MR Application sends the Media Player Entry to Media Player.

8. The Media Player establishes the transport session to acquire manifest information (e.g., MPD for DASH streaming)

9. The Media Player requests the MPD.

10. 5GMSd AS provides the MPD.

11. The Media Player processes the MPD to acquire the necessary information for accessing media content.

12. The Media Player notifies the necessary information acquired from the MPD to the Media Session Handler.

13. The Media Player configures the media playback pipeline.

14. The Media Player establishes the transport session(s) to acquire the media content.

15. The Media Player notifies to the Media Session Handler that the playback is ready.

16. The 5G EDGAR UE provides the AR/MR application with content captured by the camera, pose information and potentially AR/MR metadata for rendering (e.g., position of the object to be inserted into the real world in MR scenarios)

17. The MR/AR application provide the Media Player with pose information.

18. The Media Player requests the immersive media segments according to the MPD (possibly taking into account the pose information)

19. The Media Player receives the immersive media segments and triggers the media rendering pipeline.

20. The Media Player sends the decoded immersive media to the AR/MR application for rendering.

21. The AR/MR application renders the viewport with the content captured by the camera, pose information and potentially AR/MR metadata for rendering provided by the 5G EDGAR UE.

22. The AR/MR application sends rendered viewport and metadata (e.g., pose for which the viewport is generated) to the 5G EDGAR UE.

23. The 5G EDGAR UE processes the received viewport applies pose correction and displays it.