**3GPP SA4#114-eS4-210767**

**19-28 May 2021**

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| *CR-Form-v12.0* |
| **Pseudo CHANGE REQUEST** |
|  |
|  | **26.804** | **CR** | **<CR#>** | **rev** | **-** | **Current version:** | **0. 2.1** |  |
|  |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network | **X** |

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|  |
| ***Title:***  | [FS\_5GMS-EXT] Updated text for uplink streaming: additional gap analysis |
|  |  |
| ***Source to WG:*** | Tencent |
| ***Source to TSG:*** | SA4 |
|  |  |
| ***Work item code:*** | FS\_5GMS-EXT |  | ***Date:*** | 2021-05-10 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | Rel-17 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)Rel-12 (Release 12)**Rel-13 (Release 13)Rel-14 (Release 14)Rel-15 (Release 15)Rel-16 (Release 16)* |
|  |  |
| ***Reason for change:*** | The study item description identifies the key topic “Uplink Streaming”. |
|  |  |
| ***Summary of change:*** | Adding additional gap analysis |
|  |  |
| ***Consequences if not approved:*** | Key topic not addressed |
|  |  |
| ***Clauses affected:*** |  |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
| ***56***  |  |
| ***This CR's revision history:*** |  |

**===== CHANGE 1 =====**

### 5.5.5 Potential open issues

#### 5.5.5.1 Potential open issues in 5G Media Streaming stage 3

The following open issues seem to exist in TS 26.512 [16]:

1. Lack of a standard template (or clear reference on how to use an existing standard template) for inclusion in a Content Publishing Configuration, i.e. to be able to provide content preparation instructions in a defined, interoperable format that the 5GMS AF supports through M1.

2. Lack of definition of egest protocols (or clear reference in TS 26.512 [16] on how to use the existing ingest protocols for egest to the 5GMSu Application Provider in uplink through M2u).

NOTE: The Content Protocols Discovery APIs allows the 5GMSu Application Provider to discover the supported egest protocols by 5GMSu AS. However, clause 8.1 of TS 26.512 does not currently list any specific egest protocols alongside those for downlink ingest streaming.

3. Lack of content publishing API, i.e. a similar functionality to Content Hosting Configuration in downlink streaming, for provisioning the uplink streaming through M1u.

4. Lack of Service Access Information for uplink streaming.

For downlink streaming, TS 26.512 [16] defines a StreamingAccess object as part of the Service‌Access‌Infromation resource. The StreamingAccess object includes a URL string that points to a media download resource or a manifest that describes a media presentation. In the case of uplink streaming, TS 26.512 does not yet specify which uplink ingest protocols are supported in M5u. Furthermore, it is not clear how the Media Session Handler would retrieve the entry point for uplink ingest streaming to the 5GMSu AS.

#### 5.5.5.2 Potential open issues compared with FLUS

##### 5.5.5.2.1 General

Clause 5.5.3.1 describes the uplink streaming features from TS 26.238 [X] that are missing from TS 26.512 [16]. This section translates these missing FLUS features into potential new 5G Media Streaming features.

Table 5.5.5.2 show list of FLUS features and the equivalent features missing from TS 26.512. Note that in this table, the missing features of 26.512 are only listed for further discussion below, i.e. this is not a listed of proposed features to be added.

Table 5.5.5.2‑1: Mapping existing additional features of FLUS to 5GMS architecture

|  |  |  |  |
| --- | --- | --- | --- |
| Feature # | Existing support in FLUS | Equivalent in 5GMS  | Needed or not? |
| 1 | The FLUS Control Source can discover multiple FLUS sinks. | The 5GMSu Client can discover multiple 5GMSu AS instances. | Supported by EAS (Edge Application Server as defined in TR 26.803 [Y]) profile discovery1. |
| 2 | The FLUS Control Source can discover the capabilities of each discovered FLUS Sink, including its network-based media processing capabilities. | The UE5GMSu Client can discover the capabilities of each discovered 5GMSu AS. | Supported by EAS profile1. |
| 3 | The FLUS Control Source can also request a FLUS Sink to perform media processing. | The UE can also request the 5GMSu AS to perform media processing. | Not needed if the Content Preparation Template supports a generic media processing description such as NBMP2. |
| 4 | The UE capabilities (formats, connectivity protocol, remote control) may be discovered by a FLUS Control Sink. | The 5GMSu Client capabilities may be discovered by 5GMSu AF. | Not needed in this form, since this information can be provided by 5GMS Application Provider3. |

See the discussions below for further explanation.

##### 5.5.5.2.2 Discussion 1

The FLUS Discovery Server provides the means for a FLUS Control Source to discover multiple FLUS sinks and their capabilities. In the 5GMS architecture, various 5GMSd AS instances might have different capabilities. However, TS 26.512 does not provide a framework for describing 5GMS AS capabilities or any capability-based discovery mechanism.

TR 26.803 [Y] proposes an edge-enabled 5GMS architecture for discovering EAS-enhanced 5GMSd AS instances and their capabilities by an Edge-Enabled Client (EEC) using EAS discovery filters. One possible way to discover 5GMSu AS capabilities and/or to instantiate a new 5GMSu AS with the desired capabilities is to use the procedure described in TS 26.803 [Y] for the 5GMSu AS. This approach requires that the 5GMSu Client’s Media Session Handler supports the EEC logical function, the 5GMSu AF supports the EES logical function, and the 5GMSu AS supports the EAS logical function, as defined by TS 26.558 [Z].

##### 5.5.5.2.3 Discussion 2

The request for media processing is performed by a FLUS Control Source by including a media processing document in its request to the FLUS Control Sink. Since in the present document content preparation is addressed for uplink streaming collaboration scenarios (clause 5.2.4.2), content preparation can also be used for media processing. If the content preparation template supports a generic media processing description framework such as NBMP, then content preparation can be used to provide equivalent functionality to media processing in the FLUS specification.

The 5GMS Content Preparation Template is provisioned through the M1 interface whereas in FLUS it is possible that the media processing is provisioned using the equivalent of the M5u interface. To provide the UE with the ability to provision Content Preparation Templates, the following are possible options:

A. The 5GMSu-Aware Application (if needed) provides the desired Content Preparation Template to the 5GMSu Application Provider via M8u and then the Application Provider requests provisioning of the Content Preparation Template through M1u, or

B. The Media Session Handler in the 5GMSu Client requests the setting up of a Content Preparation Template by direct interaction with the 5GMSu AF via M5u. In this case, M5u needs to be extended to support Content Preparation Template provisioning requests from the Media Session Handler.

The current design supports option A. Option B seems unnecessary for the following reasons:

- It wouldn’t be scalable to maintain a separate uplink streaming Provisioning Session at the 5GMSu AF for each and every UE, especially as the number of UEs becomes large.

- In the current design, it is possible to create a separate Provisioning Session for each class of UE. In this approach, the UE signals its capabilities to the 5GMSu AF when requested Service Access Information at M5u, and then it is the task of 5GMSu AF to match the declared UE capabilities against the right uplink Provisioning Session metadata when responding to the request.

##### 5.5.5.2.4 Discussion 3

In the 5GMS architecture, the session is generally provisioned by the 5GMSu Application Provider. The Application Provider may already know the 5GMSu Client’s capabilities, for example through information in a user profile, or provided by the 5GMSu-Aware Application via M8u. Therefore, the need for the 5GMSu AF to discover the 5GMSu Client capabilities through M5u seems unnecessary.

**===== CHANGE 2 =====**

### 5.5.6 Candidate Solutions

#### 5.5.6.3 Uplink entry point

The StreamingAccess object can be extended to support both downlink and uplink streaming entry points. This object may include the following information:

* One or more URNs defining the uplink streaming protocol over M4u (e.g. MPEG DASH, HLS, DASH-IF ingest profile 1 or profile 2)
* The entry URL for the above service (i.e.,address of the 5GMSu AS for uplink stgreaming delivery by Media Streamer over M4u).

Additionally, the StreamingAccess object may include alternative protocols for the same session. For instance, a StreamingAccess object may include an MPEG‑DASH MPD as well as HLS m3u8 for the same downlink streaming Service Access Information, or two entry points in the Service Access Information for uplink streaming using DASH-IF ingest profile 1 and profile 2. An example of such extension is shown in the following tables.

Table 11.2.3.1‑1: Definition of ServiceAccessInformation resource
(extract from TS 26.512 )

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Property name | Type | Cardinality | Usage | Description |
| provisioningSessionId | String | 1..1 | RO | Unique identification of the M1d Provisioning Session. |
| … |
| StreamingAccess | Array(Object) | 0..N | RO |  |
| mediaEntryType | Urn | 0..1 | RO | A fully-qualified term identifier from the controlled vocabulary urn:3gpp:5gms:content-protocol, as specified in clause 8, indicating the type of media service available at mediaEntry. |
| mediaStreamerEntry | Url | 0..1 | RO |  Depending on the type of media entry indicated in mediaEntryType, either a URL endpoint on the 5GMSu AS to which media can be streamed directly at M4u, or else the URL of a document that can be downloaded from the 5GMSu AS which contains the parameters for uplink media streaming at M4u. |
| … |