**3GPP TSG- Meeting #124S4-230860**

**Berlin, 22 –**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  |  | **CR** | 0064 | **rev** |  | **Current version:** |  |  |
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| *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:*** | clarifications | | | | | | | | | |
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| ***Source to WG:*** |  | | | | | | | | | |
| ***Source to TSG:*** | S4 | | | | | | | | | |
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| ***Work item code:*** |  | | | | |  | ***Date:*** | | | 2023-05-16 |
|  |  | | | |  | |  | | |  |
| ***Category:*** |  |  | | | | | ***Release:*** | | |  |
|  | *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 can be 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-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | * Adds a missing clause that needs a minor update. * Questions and clarifications on service URL process raised and few edits are provided. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Addition of Service Handler URL | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | See above | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 4.3.1, 4.X.1, 5.X | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

**===== CHANGE =====**

### 4.3.1 Media Architecture

The 5GMSu Application Provider uses 5GMSu functions for uplink streaming services. It provides a 5GMSu-Aware Application on the UE the ability to make use of 5GMSu Client and network functions using 5GMSu interfaces and APIs.



Figure 4.3.1-1: Media Architecture for unicast uplink media streaming

NOTE 1: The functions indicated by the yellow filled boxes are in scope of stage 3 specifications for 5GMS. The functions indicated by the grey boxes are defined in 5G System specifications. The functions indicated by the blue boxes are neither in scope of 5G Media Streaming nor 5G System specifications.

The architecture in Figure 4.3.1-1 above represents the specified 5GMSu functions within the 5G System (5GS) as defined in TS 23.501 [2]. Three main functions are defined:

- **5GMSu AF:** An Application Function similar to that defined in TS 23.501 [2] clause 6.2.10, dedicated to 5G Uplink Media Streaming.

- **5GMSu AS:** An Application Server dedicated to 5G Uplink Media Streaming.

- **5GMSu Client:** A UE-internal function dedicated to 5G Uplink Media Streaming.

5GMSu AF and 5GMSu AS are Data Network (DN) functions and communicate with the UE via N6 as defined in TS 23.501 [2].

Functions in trusted DNs, e.g., a 5GMSu AF in the Trusted DN, are trusted by the operator's network as illustrated in Figure 4.2.3-5 of TS 23.501 [2]. Therefore, such AFs may directly communicate with relevant 5G Core functions.

Functions in external DNs, e.g., a 5GMSu AF in the External DN, may only communicate with 5G Core functions via the NEF using N33.

The architecture in Figure 4.3.1-2 below represents the media architecture connecting UE internal functions and related network functions for 5G Uplink Media Streaming.



Figure 4.3.1-2: Media Architecture for unicast uplink media streaming

NOTE 2: The functions indicated by the yellow filled boxes are in scope of stage 3 for 5GMSu. The functions indicated by the grey boxes are defined in 5GS. The interfaces indicated by solid lines are in scope of stage 3 for 5GMSu. The interfaces indicated by dashed lines are defined in 5GS. The interfaces indicated by dotted lines are neither in scope of 5GS nor 5GMSu, but are considered as part of informative call flows.

NOTE 3: Red ovals indicate API provider functions.

NOTE 4: The 5GMSu AF may also interact with the NEF for NEF-enabled API access. However, within Release 16, the NEF is only used by the 5GMSu AF to interact with the Policy and Charging Function (PCF) in 5GMS specifications.

NOTE 5: Some information might also be exchanged between 5GMSu entities and the OAM, although the OAM is not explicitly shown in the architecture.

The following functions are defined:

- 5G Media Streaming Client for uplink (**5GMSu Client**) on UE: Originator of 5GMSu service that may be accessed through well-defined interfaces/APIs. The UE may also be implemented in a self-contained manner such that interfaces M6u and M7u are not exposed at all.

- The 5GMSu Client contains two subfunctions:

- **Media Session Handler:** A function on the UE that communicates with the 5GMSu AF in order to establish, control and support the delivery of a media session, and that may perform QoE metrics reporting. The Media Session Handler exposes APIs that can be used by the 5GMSu-Aware Application. The Media Session Handler may be launched by a 3GPP-defined Service URL.

- **Media Streamer:** A function on the UE that communicates with the 5GMSu AS in order to perform uplink streaming of media content and provides a service to both the 5GMSu-Aware Application for media capturing and uplink streaming and the Media Session Handler for media session control.

- **5GMSu-Aware Application:** The 5GMSu Client is typically controlled by an external media application, e.g. an App, which implements external application or content service provider specific logic and enables a media session to be established. The 5GMSu-Aware Application is not defined within the 5G Media Streaming specifications, but the function makes use of 5GMSu Client and network functions using 5GMSu interfaces and APIs.

- **5GMSu AS:** An Application Server which hosts 5G media functions. Note that there may be different realizations of a 5GMSu AS, for example a Content Delivery Network (CDN) server.

- **5GMSu Application Provider:** External application or content-specific media functionality, e.g., media storage, consumption, transcoding and redistribution that uses 5GMSu interfaces to receive streaming media from 5GMSu Aware Applications.

- **5GMSu AF:** An Application Function that provides various control functions to the Media Session Handler on the UE and/or to the 5GMSu Application Provider. It may relay or initiate a request for different Policy or Charging Function (PCF) treatment or interact with other network functions via the NEF.

NOTE 6: There may be multiple 5GMSu AFs present in a deployment and residing within the Data, each exposing one or more APIs.

The following interfaces are defined for 5G Uplink Media Streaming:

- M1u (5GMSu Provisioning API): External API, exposed by the 5GMSu AF and which enables the 5GMSu Application Provider to provision the usage of the 5G Media Streaming system for uplink media streaming and to obtain feedback.

- M2u (5GMSu Publish API): Optional External API exposed by the 5GMSu AS used when the 5GMSu AS in the trusted DN is selected to receive the content for the streaming service.

- M3u: (Internal and NOT SPECIFIED): Internal API used to exchange information for content hosting on a 5GMSu AS within the trusted DN.

- M4u (Uplink Media Streaming APIs): APIs exposed by a 5GMSu AS to the Media Streamer to stream media content.

- M5u (Media Session Handling API): APIs exposed by a 5GMSu AF to the Media Session Handler for media session handling, control and assistance that also include appropriate security mechanisms e.g. authorization and authentication, and QoE metrics reporting.

- M6u (UE Media Session Handling APIs): APIs that may be exposed by a Media Session Handler to the Media Streamer for client-internal communication, and to the 5GMSu-Aware Application to make use of 5GMSu functions. This API may be supported by a 3GPP-defined Service URL.

- M7u (UE Media Streamer APIs): APIs that may be exposed by a Media Streamer to the 5GMSu-Aware Application and Media Session Handler to make use of the Media Streamer, including configuration of QoE metrics to be measured and logged, and the collection of metrics measurement logs.

- M8u: (Application API): application interface used for information exchange between the 5GMSu-Aware Application and the 5GMSu Application Provider, for example to provide Service Access Information to the 5GMSu-Aware Application. This API is external and not specified in the 5GMS architecture.

NOTE 7: Non-Standalone, Roaming, Non-3GPP Access and EPC-5GC interworking aspects are FFS.

**===== CHANGE ====**

## 4.X 3GPP Service URL Handling

#### 4.X.1 General

Where there is a facility for an application or service to launch a UE function on the same UE via a URL request, it is convenient to use such a mechanism to launch media session handling for a 5G Media Streaming session. In this case, the Media Session Handler can be launched implicitly as a result of a request for a URL with a prefix that matches a value previously registered with the UE Operating System by the Media Session Handler. Media streaming may also be launched as a by-product of the URL request by embedding a Media Entry Point in the URL. This enables 5G Media Streaming sessions to be launched by any UE application (not just a 5GMS-Aware Application), or from a link in a web page.

If the Media Session Handler is not available on the UE, or the Media Session Handler is not able to resolve the service, then the 3GPP Service URL shall resolve to an endpoint on the 5GMS AF which may respond to the URL request, for example, by a redirecting the application to a Media Entry Point. This clause defines the baseline requirements for a 3GPP Service URL that can be used to activate a 5G Media Streaming session in line with step 5 of clause 5.1 (for downlink Media Streaming), and steps 4 and 6 of clause 6.1 (for uplink Media Streaming). The detailed baseline procedure for handling these 3GPP Service URLs is defined in clause 5.X.

#### 4.X.2 Baseline parameters of 3GPP Service URL for 5G Media Streaming

The following parameters may be included explicitly or implicitly in the 3GPP Service URL when it is used to launch a 5G Media Streaming session:

Table 4.X.2: Baseline parameters of 3GPP Service URL for 5G Media Streaming

|  |  |  |
| --- | --- | --- |
| Parameter | Use | Description |
| Service type | M | Uniquely indicating either downlink 5G Media Streaming or uplink 5G Media Streaming. |
| Service identiifer | M | A globally unique service identifier that can be resolved to a Provisioning Session ID by the 5GMS System. |
| Media Entry Point | 0 … N | URLs of a Media Entry Point on a 5GMS AS to be launched by the Media Session Handler after successful initiation of media session handling and establishment of communication with the Media Stream Handler (Media Player or Media Streamer). |
| Acceptable media types | C | Indicating a set of media types acceptable to the 5GMS-Aware Application for a 5G Media Streaming session. The media type may include additional parameters such as profiles or codecs parameters.  Present if no Media Entry Point is provided. These values are used by the Media Session Handler to select the appropriate Media Entry Point provided by the 5GMS AF. |

The 3GPP Service URL for 5G Media Streaming may also include information to support handling of eMBMS or MBS delivery.

**===== CHANGE =====**

## 5.X Procedures for Service URL Handling

### 5.X.1 Baseline procedure

The launch of a 5GMS session using a 3GPP Service URL is shown in Figure 5.X.1-1. In this procedure, the Application is not assumed to be a 5GMS-Aware Application.



Figure 5.X.1-1 Baseline procedure for 3GPP Service URL Handling

The call flow is as follows:

1. The 5GMS Application Provider provisions media streaming services at reference point M1. The 5GMS AF provides the 5GMSd Application Provider a unique 3GPP Service URL as part of the Provisioning Session. A Media Entry Point URL may be embedded in this 3GPP Serivce URL.

2. The Application discovers the set of currently available media services at reference point M8. A media service may include one 3GPP Service URL.

3. The user selects a media service in the Application.

4. The Application requests the 3GPP Service URL corresponding to the media service. If the Media Session Handler is available, it handles and resolves the URL. Otherwise, the URL may be sent directly to the 5GMS AF. In this case, the 5GMS AF may provide a Media Entry Point corresponding the 3GPP Service URL, or reject the request.

5. The Media Session Handler may collect additional service parameters from the 5GMS AF.

6. If the 3GPP Service URL requested in step 4 contains an embedded Media Entry Point URL, or if a Media Entry Point URL was obtained in step 4 or step 5, the Media Session Handler launches the Media Stream Handler.

Alternatively, the Application may launch the Media Stream Handler directly itself by using any Media Entry Points that is obtained in step 2 and is supported by the device.

7. Inter-Process Communication is established between the Media Stream Handler and the Media Session Handler.

8. Media streaming occurs between the Media Player, 5GMS AS and the 5GMS Application Provider.