**3GPP TSG- Meeting #**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
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|  |  | **CR** |  | **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:***  |  |
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| ***Source to WG:*** |  |
| ***Source to TSG:*** |  |
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| ***Work item code:*** |  |  | ***Date:*** |  |
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| ***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 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-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
|  |  |
| ***Reason for change:*** | TR 26.804 and TS 26.501 provides details on Service URL Handling. Specifications for the 3GPP Service Handler and URL including the necessary functions on UE and device to support automatic launch of 5G System services in the context of 5G Media Streaming based on the conclusions in clause 6.13 of TR26.804.The work item objectives state9) Specifications for the 3GPP Service Handler and URL including the necessary functions on UE and device to support automatic launch of 5G System services in the context of 5G Media Streaming based on the conclusions in clause 6.13 of TR 26.804. |
|  |  |
| ***Summary of change:*** | - Specify a concrete URL format for 3GPP services with individual host names registered in the 3GPP-managed domain launch.3gppservices.org as part of 3GPP specifications, and ensure that this can be used in the context of 3GPP-based services, namely:- Specify a suitable website redirection mechanism in case a suitable 3GPP Service Handler is not already installed on the device to handle the URL. The URL itself needs to be sufficiently unambiguous to resolve to the service entry point URL and may embed the service entry point URL as well.- Specify 3GPP Service URL instantiations with parameters suitable for launching at least the Media Session Handler for 5G Media Streaming, MBMS Client (including Receive-Only Mode services) and MBS Client.- Provide the ability for a 5GMS-Aware Application to create a Service URL in order to bootstrap 5G Media Streaming.- Investigate and study the application of 3GPP services and URL handling beyond 5G Media Streaming.- Specify an external service identifier assigned by the 5GMS Application Provider that can be used to launch 5G Media Streaming sessions on different 5GMS Systems via a common 3GPP Service URL.- Modify the Provisioning Session resource to include one (or more) of these identifiers.- Modify the Service Access Information API to accept this instead of a Provisioning Session identifier.- Specify a default 5GMS AF host name to be used by the Media Session Handler when the 3GPP Service URL does not specify one. |
|  |  |
| ***Consequences if not approved:*** |  |
|  |  |
| ***Clauses affected:*** | 7.2.3.1, 11.2.2, X(New), Annex X(new) |
|  |  |
|  | **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:*** | Service URL Handling is eventually a candidate to be added to a common specification in 26.51x Session HandlingThis is really a starting point, details need to be progressed.Until the next meeting, an implementation in the 5G-MAG Reference Tools is planned. |
|  |  |
| ***This CR's revision history:*** |  |

## ===== CHANGE (NEW) =====

### 4.8.3 3GPP Service URL handling procedures

#### 4.8.3.1 Assumptions

In order to address the cases in clause 5.13.4, it is proposed to:

- Register a unique host name in the 3GPP-managed domain 3gppservices.org for each 3GPP service as part of 3GPP specifications such that service instances can be referenced under a controlled URL, e.g. http://ms.launch.3gppservices.org and https://ms.launch.3gppservices.org for 5G Media Streaming services.

- Specify a website/redirection mechanism in case a suitable 3GPP Service Handler is not already installed on the UE to handle the URL.

- The URL itself needs to be constructed in such a way that it can be resolved to the media service, for example by embedding the media entry point URL.

- Specify an application/service that realises the UE-based 3GPP Service Handler which declares an intent filter so that the application acts as the default handler for the 3GPPP Services domain name registered above. The intent filter includes the following declarations:

- The DEFAULT category to allow the application to respond to implicit intents.

- The BROWSABLE category in order for the intent filter to be invoked when clicking a link in a browser.

- <data> tags including the android:scheme attribute for both HTTP and HTTPS.

- A <data> tag including the android:host attribute with the registered 3GPP Services domain.

- Verify ownership details see [here](https://blog.branch.io/how-to-open-an-android-app-from-the-browser-2/).

An example intent filter is provided below:

|  |
| --- |
| <intent-filter android:autoVerify="true">    <action android:name="android.intent.action.VIEW" />    <category android:name="android.intent.category.DEFAULT" />    <category android:name="android.intent.category.BROWSABLE" />    <data android:scheme="http" />    <data android:scheme="https" />    <data android:host=" launch.3gppservices.org " /></intent-filter> |

#### 4.8.3.2 General behaviour

Based on this setup, the following set of actions and calls happen:

1. A 3GPP Service Handler background service is pre-installed on the UE by the vendor or installed once by the user. The manifest includes an intent filter that declares an interest in the 3GPP Services domain.

2. The Media Service Provider has a service with an entry point URL.

3. The Media Service Provider negotiates all service parameters with the 5G System (provisioning).

4. The Media Service Provider creates a bootstrapping URL (much like a landing page URL).

- http://ms.launch.3gppservices.org/<service parameters>

- https:// ms.launch.3gppservices.org/<service parameters>

5. The Media Service Provider provides:

- Only the 3GPP Service URL to a Portal Service Provider, search engine, etc., if the service requires 3GPP service launch. This may embed the service entry point URL.

- Both the service entry point URL and the 3GPP Service URL, if the 3GPP service is only an enhancement to launch the third-party service.

6. The Portal Service Provider provides these URLs to the Portal Application running on the UE, e.g. as part of a script, for display in a web page etc.

When the service is selected by the user, the Portal Application obtains or generates a 3GPP Service URL and submits a request for it.

7. If a 3GPP Service Handler for the requested service type identifier is already installed on the UE, it is invoked in the background by the mobile Operating System via its registered intent filter to handle the URL and:

- Uses the service parameters to establish the 3GPP service in the background (if appropriate or available) and potentially connects to the network.

- Extracts the media service entry point URL from the 3GPP Service URL and uses it to the Media Service Application.

- Establish Inter-Process Communication with other UE functions, as required.

- The Media Session Handler (Media Player or Media Streamer) may be launched by the 3GPP Service Handler, if separate from the Media Service Application.

8. If a 3GPP Service Handler for the requested service type identifier is not yet installed on the UE:

- A network service is called and runs the 3GPP Service URL resolution. In the simplest case, this resolution, included in the MNO's network, redirects to the media service or

- An HTTP 404 client error response is returned by the UE Operating System and the Portal Application either terminates the service or uses the alternate over-the-top entry point.

#### 4.8.3.3 Launch of 5G Media Streaming session by 5GMS-Aware Application

The Media Session Handler shall play the role of 3GPP Service Handler for 5GMS Service URLs by registering itself as the URL handler for the domain name ms.launch.3gppservices.org (e.g., by declaring an intent filter in an Android application manifest). Hence, the Media Session Handler is launched when a 5GMS-Aware Application requests a 5GMS Service URL (e.g., by means of an Android intent filter).

#### 4.8.3.4 Retrieval of Service Access Information

If it needs to retrieve Service Access Information from the 5GMS AF (because a full set of Service Access Information has not been supplied as additional parameters of the 3GPP Service URL) the Media Session Handler shall decompose the 3GPP Service URL into the prefix, mid-part and suffix, and shall form the M5 request URL for Service Access Information as specified in clause 11.2.2.

1. If the 3GPP Service URL carries one or more af-host-address query parameters, the Media Session Handler shall choose one to substitute into {apiRoot} in the above request URL. 80 (for HTTP) or (for HTTPS) shall be

NOTE 1: This corresponds to collaboration scenarios where the 5GMS AF is deployed in the External DN.

 The party operating the 5GMS AF is responsible for ensuring that the hostname(s) resolve to the correct IP address(es) in the External DN.

 If more than one af-host-address query parameter is supplied in the 3GPP Service URL, the Media Session Handler may use an alternative host endpoint address at reference point M5 if the one it is using fails to respond after some implementation-specific number of retries.

2. If the af-host-address query parameter is omitted from the 3GPP Service URL, the default host name ms.af.3gppservices.org and port number 80 (HTTP) or 443 (HTTPS) ahall be used instead.

NOTE 2 This corresponds to collaboration scenarios where the 5GMS AF is deployed in the Trusted DN.

 The 5G System operator is responsible for supporting resolution of this well-known host name to the correct IP address(es) in the Trusted DN, e.g., by managing appropriate DNS records.

 The 5G System operator is responsible for ensuring that a resilient service is available at this host endpoint address. If the hostname resolves to multiple IP addresses, the Media Session Handler may use a different one at reference point M5 if the one it is using fails to respond after some implementation-specific number of retries.

NOTE 3 It is recognised that correct resolution of the hostname may be hampered if the end user configures an alternative DNS resolution service. Unless the Media Session Handler is able to override this and use the 5G System DNS resolution service, this is considered a failure case for 5G Media Streaming session initiation that is reportable to the end user.

3. If the 3GPP Service URL includes the optional media-entry-point query parameter, the Media Session Handler issues a request for this URL (thereby chaining the Media Stream Handler), but only after it has successfully retrieved the Service Access Information from the 5GMS AF.

Depending on the success (or otherwise) of retrieving the Service Access Information (and optionally chaining the Media Stream Handler with the media entry point), the Media Session Handler returns an appropriate HTTP status code to the invoking 5GMS-Aware Application.

## ===== CHANGE =====

## 5.1 General

Uplink media streaming functional entities in the 5GMS System include the 5GMSu Application Provider, 5GMSu AF, 5GMSu AS and the UE. To make use of these other entities, the UE includes a 5GMSu-Aware Application that is provided by the 5GMS Application Provider and a 5GMSu Client comprising the Media Session Handler and the Media Streamer.

The M1 Provisioning API enables the 5GMSu Application Provider to establish and manage the uplink media session handling and streaming options of the 5GMSu system.

The M2u Egest interface enables uplink media streaming content sent by the 5GMSu Client to the 5GMSu AS over interface M4u to be subsequently delivered to the 5GMSu Application Provider. Uplink media streaming media transfer from the 5GMSu AS to the 5GMSu Application Provider may be either pull-based and initiated by the 5GMSu Application Provider using the HTTP GET method, or push-based and initiated by the 5GMSu AS using the HTTP PUT method. The resource identifier of the 5GMSu Application Provider for push-based streaming content delivery is provided to the 5GMSu AS by the 5GMSu AF over the M3u interface, as part of the M1 Provisioning Session.

The 5GMSu AF, having acquired M1 Provisioning information, sets up an M5 endpoint from which Service Access Information for uplink media streaming may be retrieved using its provisioned external application identifier. The Service Access Information includes configuration and policy parameters concerning session management, remote control, metrics reporting, network assistance and request for policy and/or charging treatment.

The 5GMSu-Aware Application initiates a new uplink media streaming session by launching the Media Stream Handler at reference point M6u using a 3GPP Service URL for 5GMS (see clause 4.8.3). The 3GPP Service URL indicates the external application identifier. This may be used to retrieve Service Access Information from the 5GMSu AF at reference point M5. Alternatively, if the 5GMSu-Aware Application has already acquired all necessary Service Access Information via private means at reference point M8, this may be supplied directly to the Media Session Handler at reference point M6u as additional parameters.

Certain types of Service Access Information acquired by or supplied to the Media Session Handler, such as uplink metrics reporting, QoS policy, or support for AF-based network assistance are further passed to the Media Streamer via the M7u API.

Based on the configuration information received on M5 and a request from the Media Streamer received over the M6u interface, the Media Session Handler sets up an uplink media streaming session with the 5GMSu AF. Upon successful session establishment, the Media Session Handler triggers the Media Streamer to begin uplink media streaming of media content to the 5GMSu AS over the M4u interface.

Subscription to status and other event notification services are offered by the Media Session Handler to the 5GMSu-Aware Application and to the Media Streamer via the M6u APIs exposed by the Media Session Handler.

Subscription to status and other event notification services are also offered by the Media Streamer to the 5GMSu-Aware Application and to the Media Session Handler via the M7u APIs exposed by the Media Player.

## ===== CHANGE =====

#### 7.2.3.1 ProvisioningSession resource

The data model for the ProvisioningSession resource is specified in Table 7.2.3.1-1 below. Different properties are present in the resource depending on the type of Provisioning Session indicated in the provisioningSessionType property, and this is specified in the *Applicability* column.

Table 7.2.3.1‑1: Definition of ProvisioningSession resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Property name | Type | Cardinality | Usage | Description | Applicability |
| provisioningSessionId | ResourceId | 1..1 | C: RR: RO | A unique identifier for this Provisioning Session. | All types. |
| provisioningSession‌Type | Provisioning‌Session‌Type | 1..1 | C: RWR: ROU: – | The type of Provisioning Session. | All types. |
| aspId | AspId | 0..1 | C: WR: RO | The identity of the Application Service Provider responsible for this Provisioning Session, as specified in clause 5.6.2.3 of TS 29.514 [34]. | All types. |
| externalApplicationId | ApplicationId | 1..1 | C: RWR: ROU: RO | The external application identifier (see TS 29.571 [12]), nominated by the 5GMS Application Provider, to which this Provisioning Session pertains. | All types. |
| serverCertificateIds | Array(ResourceId) | 0..1 | C: –R: RO | A list of Server Certificate identifiers currently associated with this Provisioning Session. | downlink |
| contentPreparation‌TemplateIds | Array(ResourceId) | 0..1 | C: –R: RO | A list of Content Preparation Template identifiers currently associated with this Provisioning Session. | downlink,uplink |
| metricsReporting‌ConfigurationIds | Array(ResourceId) | 0..1 | C: –R: RO | A list of Metrics Reporting Configuration identifiers currently associated with this Provisioning Session. | downlink,uplink |
| policyTemplateIds | Array(ResourceId) | 0..1 | C: –R: RO | A list of Policy Template identifiers currently associated with this Provisioning Session. | downlink,uplink |
| edgeResources‌ConfigurationIds | Array(ResourceId) | 0..1 | C: –R: RO | A list of Edge Resources Configuration identifiers currently associated with this Provisioning Session. | downlink,uplink |
| eventDataProcessing‌ConfigurationIds | Array(ResourceId) | 0..1 | C: –R: RO | A list of Event Data Processing Configuration identifiers currently associated with this Provisioning Session. | downlink,uplink |

## ===== CHANGE =====

### 11.2.2 Resource structure

The Service Access Information API is accessible through the following URL base path:

{apiRoot}/3gpp-m5/{apiVersion}/service-access-information/

The operations and the corresponding HTTP methods in Table 11.2.2-1 are supported. In each case, the sub-resource path specified in the second column shall be appended to the URL base path.

Table 11.2.2‑1: Operations supported by the Service Access Information API

|  |  |  |  |
| --- | --- | --- | --- |
| Operation | Sub-resource path | Allowed HTTP method(s) | Description |
| Fetch Service Access Information | *{external‌Application‌Id}* | GET | Used to acquire the Service Access Information resource for the specified Provisioning Session.The {provisioningSessionId} uniquely identifies the Service Access Information Resource and is allocated by the 5GMS AF during creation of a Provisioning Session. |

## ===== CHANGE (NEW) =====

## 12.4 3GPP Service URL for 5G Media Streaming

### 12.4.1 Introduction

As defined in clauses 4.10 and 9 of TS 26.501 [2], the purpose of the 3GPP Service URL for 5G Media Streaming is to trigger media session handling of a new media streaming session in the Media Session Handler and (optionally) to launch media stream handling by the Media Stream Handler based on the execution of a URL.

### 12.4.2 URL structure

The 3GPP Service URL format used to initiate 5G Media Streaming sessions takes the following form:

http[s]://ms.launch.3gppservices.org/service-id/{external\_service\_id}?{query\_parameters}

The formal ABNF, following the syntax of RFC 8820 (HTTP URLs) [X] and RFC 3986 (URLs) [11] is specified in listing 12.4.2‑1:

Listing 12.4.2-1: ABNF syntax of 3GPP Service URL for 5G Media Streaming

|  |
| --- |
| 3gpp-service-URI = "http:" "//" authority path-abempty \*( "&" mid-label "=" mid-value )  [ "&label=" resourceURI ]authority = <authority, see [RFC3986], Section 3.2>path-abempty = <path-abempty, see [RFC3986], Section 3.3>mid-label = ALPHA \*( ALPHA / DIGIT )mid-value = 1\*uchar = unreserved / pct-encoded / ";" / "?" / ":" /  "@" / "=" / "+" / "$" / "," / "/" unreserved = <unreserved, see [RFC3986], Section 2.3>pct-encoded = <pct-encoded, see [RFC3986], Section 2.1>resourceURI = <URI, see [RFC3986], Section 3> |

The parameters of the 3GPP Service URL for 5G Media Streaming are defined in table 12.4.2-1.

Table 12.4.2-1: 3GPP Service URL parameters

|  |  |  |
| --- | --- | --- |
| Path element | Cardinality | Description |
| external\_application\_id | 1 | An External Service Identifier that resolves to a Provisioning Session in the 5GMS System (see NOTE). |
| Query parameter | Cardinality | Description |
| af-host-address | 0..\* | The Fully Qualified Domain Name and optional port number of a 5GMS AF endpoint to be used by the Media Session Handler at reference point M5 with the format hostname[:port].More than one occurrence of this parameter may be present in the Service URL to indicate alternative host endpoint addresses. Any of these may be used by the Media Session Handler at reference point M5.Supplied by the invoking 5GMS-Aware Application when the 5GMS AF is deployed in an External DN. The endpoint address(es) may, for example, have been passed to the 5GMS-Aware Application via reference point M8.If omitted, the Media Session Handler assumes the default 5GMS AF host endpoint address ms.af.3gppservices.org:443 is to be used at reference point M5. |
| media-entry-point | 0..1 | A Media Entry Point reference expressed as a fully qualified URL at reference point M4.If supplied, used by the Media Session Handler to launch the Media Stream Handler (Media Player or Media Streamer) after successfully initiating media session handling. |
| content-type | 0..\* | A MIME content type string conforming to section 5 of RFC 2045 [X] identifying a type of Media Entry Point that is acceptable to the Media Stream Handler (Media Player or Media Streamer).More than one occurrence of this parameter may be present in the Service URL to indicate that more than one type of Media Entry Point is acceptable.Used by the Media Session Handler to eliminate unacceptable Media Entry Points from those listed in the Service Access Information.It is an error to supply this parameter if an explicit Media Entry Point is specified using media-entry-point. |
|  |

The external\_application\_id path element and af-host query parameter correspond to the baseline Service Access Information for downlink media streaming specified in clause 4.2.3 of TS 26.501 [2] and the baseline parameters of the 3GPP Service URL for 5G Media Streaming defined in clause 4.10.2 of [2]. Together, they enable a full set of Service Access Information to be retrieved by the Media Session Handler from the 5GMS AF using the M5 Service Access Information API specified in clause 11.2 of the present document.

The media-entry-point parameter is used to support the procedure where the Media Session Handler launches media playback in the Media Stream Handler (Media Player or Media Streamer) after successfully retrieving a full set of Service Access Information via reference point M5 (if needed) and after successfully initiating media session handling.

The remaining parameters are used for client-side filtering of Media Entry Point information provided in the Service Access Information and selection of one Media Entry Point by the Media Session Handler. (They are mutually exclusive with the media-entry-point parameter.) In this case, media playback by the Media Stream Handler (Media Player or Media Streamer) is launched by the Media Session Handler with its chosen Media Entry Point.

If the 5GMS-Aware Application prefers to launch media streaming itself (rather than have the Media Session Handler launch media streaming on its behalf), the media-entry-point query parameter and all client-side filtering parameters shall be omitted from the 3GPP Service URL. In this case, the Media Session Handler only initiates media session handling for the 5GMS Provisioning Session identified by the External Application Identifier.

## ===== CHANGE (NEW) =====

Annex Y (informative):
Example 3GPP Service URLs

To be completed.

## ===== CHANGE (NEW) =====

Annex X (normative):
Registration of 3GPP Service URLs

# X.1 General

This annex provides the 3GPP Service URL registration information for different systems.

# X.2 Android association of 3GPP Service URLs

To be completed.