**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:*** |  |
|  |  |  |  |  |
| ***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)* |
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| ***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:*** | Work item not fulfilled |
|  |  |
| ***Clauses affected:*** | 2, 6 |
|  |  |
|  | **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:*** | This revision uses large parts of S4-231464 |

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

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

• References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

• For a specific reference, subsequent revisions do not apply.

• For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[23501] 3GPP TS 23.501: "System architecture for the 5G System (5GS) ".

[23502] 3GPP TS 23.502: "Procedures for the 5G System (5GS); Stage 2".

[26501] 3GPP TS 26.501: "5G Media Streaming (5GMS); General description and architecture".

[26506] 3GPP TS 26.506: "5G Real-time Media Communication Architecture (Stage 2)".

[26512] 3GPP TS 26.512: "5G Media Streaming (5GMS); Protocols".

[26113] 3GPP TS 23.113: "Real-Time Media Communication; Protocols and APIs".

[26247] 3GPP TS 26.247: "Transparent end-to-end Packet-switched Streaming Service (PSS); Progressive Download and Dynamic Adaptive Streaming over HTTP (3GP-DASH)".

[29122] 3GPP TS 29.122: "T8 reference point for Northbound APIs".

[X.509] ITU-T Recommendation X.509 (2005) | ISO/IEC 9594-8:2005: "Information Technology – Open Systems Interconnection – The Directory: Public-key and attribute certificate frameworks".

[RFC5280] IETF RFC 5280: "Internet X.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL) Profile", May 2008.

[RFC7468] IETF RFC 7468: "Textual Encodings of PKIX, PKCS, and CMS Structures", April 2015.

[23558] 3GPP TS 23.558: "Architecture for enabling edge applications".

[24558] 3GPP TS 24.558: "Enabling Edge Applications; Protocol specification".

[29558] 3GPP TS 29.558: "Enabling Edge Applications; Application Programming Interface (API) specification; Stage 3".

[23503] 3GPP TS 23.503: "Policy and charging control framework for the 5G System (5GS); Stage 2".

[23003] 3GPP TS 23.003: "Numbering, addressing and identification".

[29514] 3GPP TS 29.514: "5G System; Policy Authorization Service; Stage 3".

[29522] 3GPP TS 29.522: "5G System. Network Exposure Function Northbound APIs; Stage 3".

[27007] 3GPP TS 27.007: "AT Command set for User Equipment (UE)".

[38321] 3GPP TS 38.321: "NR; Medium Access Control (MAC) protocol specification".

[36321] 3GPP TS 36.321: "Evolved Universal Terrestrial Radio Access (E-UTRA); Medium Access Control (MAC) protocol specification".

[HTTPsemantics] IETF RFC 9110: "HTTP Semantics", June 2022.

[HTTPcaching] IETF RFC 9111: "HTTP Caching", June 2022.

[HTTP11] IETF RFC 9112: "HTTP/1.1", June 2022.

[HTTP2] IETF RFC 9113: "HTTP/2", June 2022.

[HTTP3] Reserved for future use.

[TLS13] IETF RFC 8446: "The Transport Layer Security (TLS) Protocol Version 1.3", August 2018.

[29500] 3GPP TS 29.500: "5G System; Technical Realization of Service Based Architecture; Stage 3".

[29501] 3GPP TS 29.501: "5G System; Principles and Guidelines for Services Definition; Stage 3".

[OpenAPI300] OpenAPI: "OpenAPI 3.0.0 Specification", <https://github.com/OAI/OpenAPI-Specification/blob/master/versions/3.0.0.md>.

[29571] 3GPP TS 29.571: "Common Data Types for Service Based Interfaces; Stage 3".

[RFC3339] IETF RFC 3339: "Date and Time on the Internet: Timestamps", July 2002.

[RFC3986] IETF RFC 3986: "URI Generic Syntax".

[ECMA262] Standard ECMA-262, 5.1 Edition: "ECMAScript Language Specification", June 2011.

[JSON] IETF RFC 8259: "The JavaScript Object Notation (JSON) Data Interchange Format", December 2017.

[JSONSchema] IETF draft-bhutton-json-schema-validation: "JSON Schema Validation: A Vocabulary for Structural Validation of JSON", June 2022.

[26118] 3GPP TS 26.118: "Virtual Reality (VR) profiles for streaming applications".

[29517] 3GPP TS 29.517: "5G System; Application Function Event Exposure Service; Stage 3".

[26532] 3GPP TS 26.532: "Data Collection and Reporting; Protocols and Formats".

[26346] 3GPP TS 26.346: "Multimedia Broadcast/Multicast Service (MBMS); Protocols and codecs".

[26347] 3GPP TS 26.347: "Multimedia Broadcast/Multicast Service (MBMS); Application Programming Interface and URL".

[ISO3166-1] ISO 3166‑1: "Codes for the representation of names of countries and their subdivisions — Part 1: Country codes".

[ISO3166-2] ISO 3166‑2: "Codes for the representation of names of countries and their subdivisions — Part 2: Country subdivision code".

[RFC2474] IETF RFC 2474: "Definition of the Differentiated Services Field (DS Field) in the IPv4 and IPv6 Headers".

[RFC2475] IETF RFC 2475: "An Architecture for Differentiated Services".

[RFC3246] IETF RFC 3246: "An Expedited Forwarding PHB (Per-Hop Behavior)".

[RFC2597] IETF RFC 2597: "Assured Forwarding PHB Group".

[RFC7230] IETF RFC 7230: "Hypertext Transfer Protocol (HTTP/1.1): Message Syntax and Routing".

[RFC8820] IETF RFC 8820: "URI Design and Ownership".

[RTC2045] IETF RFC 2045: "Multipurpose Internet Mail Extensions (MIME) Part One: Format of Internet Message Bodies".

[29554] 3GPP TS 29.554: "5G System; Background Data Transfer Policy Control Service; Stage 3".

[29519] 3GPP TS 29.519: "5G System; Usage of the Unified Data Repository Service for Policy Data, Application Data and Structured Data for Exposure; Stage 3".

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

# 6 3GPP Service URL

## 6.1 General

This clause defines the syntax for 3GPP Service URLs used to launch media delivery sessions and the associated URL handling.

The 3GPP Service URL may be provided to the application via reference point M8 if it is a Media-aware Application. In another variant, the application may generate a 3GPP Service URL based on information in its own configuration.

## 6.2 3GPP Service URL syntax

3GPP Service URLs used to initiate media delivery sessions shall take the following form:

http[s]://md.launch.3gppservices.org/{service}/{service\_id}?{query\_parameters}

The formal ABNF, following the syntax of RFC 8820 (HTTP URLs) [RFC8820] and RFC 3986 (URLs) [RFC3986] is specified in listing 6.2.1‑1:

Listing 6.2-1: ABNF syntax of 3GPP Service URL Media Delivery

|  |
| --- |
| Service-URI = scheme ":" hier-part \*( "&" mid-label "=" mid-value ) [ "&label=" resourceURI ] [ "?" query ] [ "#" fragment ]scheme = "http:" / "https:" hier-part = "//" 3gpp-domain "/" service [/ service\_id]3gpp-domain = "md.launch.3gppservices.org"service = service-label / "generic"service-label = ALPHA \*( ALPHA / DIGIT )service\_id = 1\*ucharmid-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 structure of the 3GPP Service URL is as follows:

- The *prefix part* starts with the scheme-name http:// or https:// followed by a double-slash //, followed by the authority md.launch.3gppservices.org, a service indicator service, service identifier service\_id and an optional path, as defined for RFC 7230 [RFC7230] with the restriction that the prefix part shall not contain the character "&".

- The *mid-part* consists of zero or more &name=value pairs or flags without an equals character. Specific name–value pairs and flags may be defined for service type.

- The suffix is optional and consists of the string "&label=" followed by a URI which identifies the desired M5 media service, and optionally, as for all URIs, a query or fragment part. The suffix is terminated by the end of the URL.

When a Media Application Provider wishes to use a 3GPP Service URL to identify resources made available by them via 3GPP media delivery, it shall use the prefix part of the 3GPP Service URL as serviceId for the service. The creator of the serviceId URI shall be authorized by the 'authority' (see below) identified in that serviceId.

## 6.3 Handling of 3GPP Service URLs by Media Client

Requests for 3GPP Service URLs from Media-aware Applications shall be handled by the Media Session Handler at reference point M6.

Requests for 3GPP Service URLs from other applications shall be handled by the Media Session Handler.

To cater for cases where a Media Session Handler is not yet present in a UE, the service provider offering the 3GPP Service URL shall provide a resolution of the 3GPP Service URL in the network that redirects the invoking application to a resource that the requesting application is able to process, for example a media file, URL to an MPD, etc. If this resolution yields a new URL, the service provider shall respond with an HTTP redirect to this new URL; otherwise an appropriate HTTP error response shall be returned.

The Media Session Handler performs decomposition of the URI into the prefix, mid-part, and suffix.

- If the URI handed to the Media Session Handler does not conform to a 3GPP Service URL, the Media Session Handler should return a proper error response to the invoking application.

- If the Media Session Handler does not support the service label service indicated in the prefix part, it should return a proper error response to the invoking application.

- If the URI indicates service being 5G Media Streaming, i.e. the service part is set to ms, then further rules for the structure as well as the processing are defined in clause 6.4.1.

- If the URI indicates a service being MBMS, i.e. the service part is set to mbms or mbms-rom, then further rules for the structure as well as the processing are defined in clause 6.4.2.

- If the URI indicates a service being real-time communication, i.e. the service part is set to rtc, then further rules for the structure as well as the processing are defined in clause 6.4.3.

Editor’s Note: Do we want to say anything about DNS

### 6.4 Service-specific 3GPP Service URLs

### 6.4.1 3GPP Service URL for 5G Media Streaming

If the service parameter in the URL indicates ms, then the target service is a 5G Media Streaming service.

The parameters of the 3GPP Service URL for 5G Media Streaming are defined in table 6.2.2-1.

Table 6.4.1-1: 3GPP Service URL parameters for 5G Media Streaming

|  |  |  |
| --- | --- | --- |
| Path element | Cardinality | Description |
| service\_id | 1 | An External Service Identifier that resolves to a Provisioning Session in the 5GMS System. |
| 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. |
| access-token | 0..1 | A token that is presented by the Media Session Handler to the 5GMS AF at reference point M5 that asserts its right to invoke the media session handling operations exposed by the 5GMS AF. |
| 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 [RFC2045] 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 service\_id path element, and the af-host-address and access-token query parameters 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 query 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 query 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.

Editor’s Note: Some information on API communication should be added.

### 6.4.2 3GPP Service URL for MBMS

If the service parameter in the URL indicates mbms or mbms-rom, then the service is an MBMS service. If the Media Session Handler supports this service, it shall implement all functions of the MBMS URL Handler as specified in clause 8 of TS 26.347 [26347].

The 3GPP Service URL for MBMS is aligned with the MBMS URL definition and handling as defined in clause 8 of TS 26.347 [26347].The parameters of the 3GPP Service URL for MBMS are specified in table 6.4.2-1.

Table 6.4.2-1: 3GPP Service URL parameters for MBMS

|  |  |  |
| --- | --- | --- |
| Path element | Cardinality | Description |
| service\_id | 1 | The MBMS Service ID. |

The following query parameters are specified for inclusion in the 3GPP Service URL for MBMS:

- In case of a regular MBMS service signaled as mbms, only the label query parameter is permitted.

- In case of a MBMS-ROM service signaled as mbms-rom, only the query parameters specified in clause 8.2.4 of TS 26.347 [26347] may be present, except for the service\_id.

### 6.2.4 3GPP Service URL for Real-Time media Communication

The service URL for Real-Time Media communication services is for further study.