**3GPP TSG-S4 Meeting #110e *S4-201052***

**Home Office, Everywhere, 19. – 28. August 2020**

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| *CR-Form-v12.0* | | | | | | | | |
| **Pseudo CHANGE REQUEST** | | | | | | | | |
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|  |  | **CR** |  | **rev** |  | **Current version:** |  |  |
|  | | | | | | | | |
| *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 |  | Radio Access Network |  | Core Network |  |

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|  | | | | | | | | | | |
| ***Title:*** | Addition of General Sections | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | S4 | | | | | | | | | |
| ***Source to TSG:*** | Ericsson LM, BBC | | | | | | | | | |
|  |  | | | | | | | | | |
| ***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 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-12 (Release 12)* *Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Missing “general sections” content | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  |  | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  |  | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  |  | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

\*\*\* First 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".

[2] 3GPP TS 26.501: "5G Media Streaming (5GMS); General description and architecture".

[3] DASH Industry Forum, "Specification of Live Media Ingest",   
<https://dashif-documents.azurewebsites.net/Ingest/master/DASH-IF-Ingest.pdf>

[4] 3GPP TS 26.247: "Progressive Download and Dynamic Adaptive Streaming over HTTP (3GP‑DASH)".

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

[6] IETF RFC 6234: "US Secure Hash Algorithms (SHA and SHA-based HMAC and HKDF)".

[7] 3GPP TS 23.003: "Technical Specification Group Core Network and Terminals; Numbering, addressing and identification".

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

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

[10] IETF RFC 4648: "The Base16, Base32, and Base64 Data Encodings".

[11] IEEE Standard 1003.1, Issue 7: "The Open Group Base Specifications", 2018.  
https://pubs.opengroup.org/onlinepubs/9699919799/

[12] 3GPP TS 29.122, “T8 reference point for Northbound APIs”

[13] 3GPP TS 38.321, "NR; Medium Access Control (MAC) protocol specification".

[14] 3GPP TS 36.321, "Evolved Universal Terrestrial Radio Access (E-UTRA); Medium Access Control (MAC) protocol specification".

[15] 3GPP TS 27.007, "AT Command set for User Equipment (UE) – (Release 16)".

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

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

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

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

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

[21] 3GPP TS 29.500, “5G System; Technical Realization of Service Based Architecture; Stage 3”

[22] 3GPP TS 29.501, “5G System; Principles and Guidelines for Services Definition; Stage 3”

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

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

[25] IETF RFC 7231: "Hypertext Transfer Protocol (HTTP/1.1): Semantics and Content".

[26] IETF RFC 7232: "Hypertext Transfer Protocol (HTTP/1.1): Conditional Requests".

[27] IETF RFC 7233: "Hypertext Transfer Protocol (HTTP/1.1): Range Requests".

[28] IETF RFC 7234: "Hypertext Transfer Protocol (HTTP/1.1): Caching".

[29] IETF RFC 7235: "Hypertext Transfer Protocol (HTTP/1.1): Authentication".

[30] IETF RFC 5246, "The Transport Layer Security (TLS) Protocol Version 1.2".

[31] IETF RFC 7540: "Hypertext Transfer Protocol Version 2 (HTTP/2)"

\*\*\*\* Next Change \*\*\*\*

# 6 General aspects of APIs for 5G Media Streaming

## 6.1 HTTP resource URIs and paths

The resource URI used in each HTTP request to the API provider shall have the structure defined in subclause 4.4.1 of TS 29.501 [22], i.e.:

{apiRoot}/{apiName}/{apiVersion}/{apiSpecificResourceUriPart}

with the following components:

-{apiRoot} shall be set as described in TS 29.501 [22].

-{apiName}shall be set as defined by the following clauses.

-{apiVersion} shall be set to "v1".

-{apiSpecificResourceUriPart} shall be set as described in the following clauses.

## 6.2 Usage of HTTP

### 6.2.1 HTTP protocol version

#### 6.2.1.1 5GMS AF

Implementations of the 5GMS AF shall expose both HTTP/1.1 [24] and HTTP/2 [31] endpoints at interfaces M1 and M5, including support for the HTTP/2 starting mechanisms specified in section 3 of RFC 7540 [31]. In both protocol versions, TLS [29] shall be supported and HTTPS interactions should be used on these interfaces in preference to cleartext HTTP.

The 5GMS Application Provider may use any supported HTTP protocol version at interface M1.

The Media Session Handler may use any supported HTTP protocol version at interface M5.

#### 6.2.1.2 5GMS AS

Editor’s Note: Future releaves may support other protocols on M2 and M4.

Implementations of the 5GMS AS shall expose HTTP/1.1 [24] endpoints at interfaces M2 and M4 and may additionally expose HTTP/2 [31] endpoints at these interfaces. In both protocol versions, TLS [30] shall be supported and HTTPS interactions should be used on these interfaces in preference to cleartext HTTP.

For pull-based content ingest, the 5GMS Application Provider shall expose an HTTP/1.1-based origin endpoint to the 5GMSd AS at interface M2 and may additionally expose an HTTP/2-based origin endpoint.

For push-based content ingest, the 5GMS Application Provider may use any supported HTTP protocol version at interface M2.

The Media Stream Handler may use any supported HTTP protocol version at interface M4.

### 6.2.2 HTTP message bodies for API resources

The OpenAPI [23] specification of HTTP messages and their content bodies is contained in Annex Y.

### 6.2.3 Usage of HTTP headers

#### 6.2.3.1 General

Standard HTTP headers shall be used in accordance with subclause 5.2.2 of TS 29.500 [21] for both HTTP/1.1 and HTTP/2 messages.

#### 6.2.3.2 User Agent identification

##### 6.2.3.2.1 Media Stream Handler identification

The Media Stream Handler in the 5GMSd Client shall identify itself to the 5GMS AS at interface M4 using a User-Agent request header (see section 5.3.3 of RFC 7231 [25]) that includes the product token 5GMSdMediaPlayer optionally suffixed with a product-version.

The Media Stream Handler may additionally supply a comment element in the User-Agent request header containing a vendor-specific identification string.

##### 6.2.3.2.2 Media Session Handler identification

The Media Session Handler in the 5GMS Client shall identify itself to the 5GMSd AF at interface M5d using a User-Agent request header (see section 5.3.3 of RFC 7231 [25]) in which the first element shall be a product identified by the token 5GMSdMediaSessionHandler (or 5GMSuMediaSessionHandler) and optionally suffixed with a product-version.

The Media Session Handler may additionally supply a comment element in the User-Agent request header containing a vendor-specific identification string.

#### 6.2.3.3 Server identification

##### 6.2.3.3.1 5GMSd AF identification

The 5GMSd AF shall identify itself using a Server response header (see section 7.4.2 of RFC 7231 [25]) of the following form:

5GMSdAF-{FQDN}/{implementationSpecificSuffix}

where {FQDN} shall be the Fully-Qualified Domain Name of the 5GMSd AF exposed to the requesting client, and {implementationSpecificSuffix} shall be determined by the implementation.

#### 6.2.3.4 Support for conditional HTTP GET requests

All responses from the 5GMS AF that carry a resource message body shall include:

- a strong entity tag for the resource, conveyed in an ETag response header,

- a resource modification timestamp, conveyed in a Last-Modified response header, and

- a predicted time-to-live period for the resource, conveyed in a Cache-Control: max-age response header.

All API endpoints on the 5GMS AF that expose the HTTP GET method shall support conditional requests using the If-None-Match and If-Modified-Since request headers. API clients should not attempt to revalidate their cached copy of a resource using a conditional GET request before the indicated time-to-live period has elapsed.

#### 6.2.3.5 Support for conditional HTTP POST, PUT, PATCH and DELETE requests

## All API endpoints on the 5GMS AF that expose the HTTP POST, PUT, PATCH or DELETE methods shall support conditional requests using the If-Match request header. The API client should supply a strong entity tag in an ETag request header when invoking any of these HTTP methods.6.3 HTTP response codes

Guidelines for error responses to the invocation of APIs of NF services are specified in clause 4.8 of TS 29.501 [22]. API specific error responses are specified in the respective technical specifications.

## 6.4 Common API data types

### 6.4.1 General

### 6.4.2 Simple data types

Table 6.4.2-1 below specifies common simple data types used within the 5GMS APIs, including a short description of each. In cases where types from other specifications are reused, a reference is provided.

Table 6.4.2-1: Simple data types

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Type name | Type definition | Description | Reference | |
| Percentage | number | A percentage expressed as a floating point value between 0.0 and 100.0 (inclusive). |  | |
| DurationSec | integer | An unsigned integer identifying a period of time expressed in units of seconds. | TS 29.122 [12] Table 5.2.1.3.2-2 | |
| DateTime | string | An absolute date and time expressed using the OpenAPI date-time string format. | TS 29.122 [12] Table 5.2.1.3.2-2 |

\*\*\* Last Change \*\*\*