**3GPP TSG- Meeting # *r01***

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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 |  |

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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 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:*** | | Add HTTP-3 as an allowed protocol for 5GMS transfers over the M1, M2, M4, and M5 interfaces, in addition to HTTP/1.1 and HTTP/2. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Adding HTTP/3 references, and adding HTTP/3 support using HTTP/2 as a template in these sections.  The references for HTTP/1.1 and HTTP/2 have been updated at the IETF, and these references are also updated in this specification. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | HTTP-based transfers over these interfaces cannot use HTTP/3 over QUIC. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 2, 6.2, 6.3 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |

# Introduction

As part of the objectives of the 5GMS\_Pro\_Ph2 work item, this document introduces HTTP/3 support for use in 5GMS protocols.

This document uses the current text for HTTP/2 support as a template for HTTP/3.

# Changes to 26.512

The following Clauses of TS 26.512 are to be updated:

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

# 2 References

[9] Void

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

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

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

[26] Void

[27] Void

[28] IETF RFC 9111: "HTTP Caching".

[29] Void

[30] IETF RFC 8446: "The Transport Layer Security (TLS) Protocol V8rsion 1.3", August 2018.

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

[QUIC] IETF RFC 9000: "QUIC: A UDP-Based Multiplexed and Secure Transport", May 2021.

[QUIC-TLS] IETF RFC 9001: "Using TLS to Secure QUIC", May 2021.

[HTTP/3] IETF RFC 9114, " HTTP/3", June 2022

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

## 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 9113 [31]. In both protocol versions, TLS [29] shall be supported and HTTPS interactions should be used on these interfaces in preference to cleartext HTTP.

Implementations of the 5GMS AF should expose HTTP/3 [HTTP/3] endpoints at interfaces M1 and M5, including support for the HTTP/3 starting mechanisms specified in section 3 of [HTTP/3]. In HTTP/3, the QUIC protocol [QUIC] is used for transport, and TLS [QUIC-TLS] is used for the initial handshake and key exchange.

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.

All responses from the 5GMS AF that carry a message body shall include a strong entity tag in the form of an ETag response header and a modification timestamp in the form of a Last-Modified response header.

All endpoints shall support the conditional HTTP requests If-none-Match and If-Modified-Since.

#### 6.2.1.2 5GMS AS

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.

Implementations of the 5GMS AS should expose HTTP/3 [HTTP/3] endpoints at interfaces M2 and M4, In HTTP/3, the QUIC protocol [QUIC] is used for transport, and TLS [QUIC-TLS] is used for the initial handshake and key exchange.

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. The 5GMS Application Provider may additionally expose an HTTP/3-based origin endpoint to the 5GMSd AS at interface M2.

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.

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

### 6.2.3 Usage of HTTP headers

#### 6.2.3.1 General

Standard HTTP headers shall be used in accordance with clause 5.2.2 of TS 29.500 [21] for HTTP/1.1, HTTP/2 and HTTP/3 messages.

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

## 8.2 HTTP pull-based content ingest protocol

If IngestConfiguration.protocol is set to urn:3gpp:5gms:content-protocol:http-pull-ingest in the Content Hosting Configuration, media resources shall be ingested by the 5GMSd AS using HTTP [25]. The IngestConfiguration.pull property shall be set to True, indicating that a Pull-based protocol is used. The IngestConfiguration.baseURL property shall point at the 5GMSd Application Provider's origin server, as specified in table 7.6.3.1‑1, and may indicate the use of HTTPS [16].

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

## 8.3 DASH-IF push-based content ingest protocol

If IngestConfiguration.protocol is set to urn:3gpp:5gms:content-protocol:dash-if-ingest in the Content Hosting Configuration, media resources shall be ingested by the 5GMSd AS as specified by the DASH‑IF Live Media Ingest specification [3]. The IngestConfiguration.pull property shall be set to False, indicating that a Push-based protocol is used. The IngestConfiguration.baseURL property shall be set by the 5GMSd AF to the base URL that is to be used by the 5GMSd Application Provider to upload the DASH segments and MPD(s) to the 5GMSd AS at reference point M2d.

NOTE: Any supported HTTP protocol version may be used for HTTP pull-based content ingest over the M2 interface, but DASH-IF push-based content ingest is described in "Specification of Live Media Ingest" [3], and this protocol is defined for HTTP/1.1 only. The intent is that if and when that specification is updated to support HTTP/2 and/or HTTP/3, these HTTP versions can also be used for push-based content ingest over interface M2 in 5G deployments.

**===== END CHANGES =====**