**3GPP TSG-SA4 Meeting #129-e *S4-241472***

**Online, , 19th Aug 2024 - 23rd Aug 2024 revision of S4aI240096**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **26.804** | **CR** | **0014** | **rev** | **2** | **Current version:** | **18.1.0** |  |
|  | | | | | | | | |
| *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:*** | [FS\_AMD] Specification Structure | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Qualcomm Germany | | | | | | | | | |
| ***Source to TSG:*** | S4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | FS\_AMD | | | | |  | ***Date:*** | | | 2024-08-12 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-19 |
|  | *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-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | One of the open issues identified in the Rel-18 feasibility study 5GMS\_Pro\_Ph2 is the need for a specification that addresses interoperability considerations around content delivery protocol features and general technologies for segmented media streaming and the IP/PDU 5G System Layer. This points to the further study media plane issues to support additional functionalities, but also identifies what needs to be ported from legacy TS 26.512 to a generalised media plane technical specification. The relation to media session handling (as specified in TS 26.510) is identified in TR 26.804, but enhancements to media session handling are not the primary focus of this study. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Adds discussion and conclusions on a Media Delivery specification | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Study item objectives are not complete | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 1, 2, 3, 4, 5.15 (new), 6.15 (new) | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | | |  |  |  |  | | --- | --- | --- | --- | | [S4aI240096](https://www.3gpp.org/ftp/TSG_SA/WG4_CODEC/3GPP_SA4_AHOC_MTGs/SA4_MBS/Docs/S4aI240096.zip) | [FS\_AMD] Specification Structure | Qualcomm Germany | Thomas Stockhammer |   **Revisions**: none  **Presenter**: Thomas Stockhammer  **Online Discussion**:   * Richard: * Thomas: I dont want to interfere with RTC at this point. * Richard: Whats wrong with 512 in its current state. That is essentially what is left. * Thomas: I am good with discussing on that * Richard: To me, the value would be to consider RTC as well * Thomas: 512 for me is still the protocols * Prakash: Is M1 and M5 out of scope? * Thomas: That is an orthogonal discussion. This is for the specification, not the study * Qi: The newly added application server configuration and management is already covered in Rel-18. This is a Rel-19 CR * Thomas: We can do a Rel-18 CR.   **Decision**:  [S4aI240096](https://www.3gpp.org/ftp/TSG_SA/WG4_CODEC/3GPP_SA4_AHOC_MTGs/SA4_MBS/Docs/S4aI240096.zip) is **noted**.  This document addresses the above comments and is submitted for endorsement. | | | | | | | | |

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

# 1 Scope

This Technical Report identifies and evaluates a set of potential improvements and extensions, referred to as key topics. The initial set of key topics were:

- Content Preparation

- Traffic Identification

- Additional / New transport protocols

- Uplink media streaming

- Background traffic

- Content Aware Streaming

- Network Event usage

- Per-application-authorization

- Support for encrypted and high-value content

- Scalable distribution of unicast Live Services

In an extension, a second set of key topics were collected as follows:

- Network Slicing Extensions for 5G Media Streaming

- 3GPP Service Handler and URLs

- 5GMS Application Server configuration and management.

In a further extension, a third set of key topics were collected as follows:

- Media Delivery Specification.

- Common Client Metadata.

- Common Server-and Network-Assisted Streaming.

- Multi-CDN and Multi-Access Media Delivery.

- Multi-Access with ATSSS.

- Modem Usage Optimized Media Streaming.

- DASH/HLS Interoperability.

- Further harmonization of RTC and Streaming for Advanced Media Delivery.

- Improved QoS support.For each of the above key topics, the following objectives are identified:

1. Document the above key topics in more detail, in particular how they relate to the 5GMS Architecture and protocols.

2. Study collaboration scenarios between the 5G System and Application Provider for each of the key topics.

3. Based on the 5GMS Architecture, develop one or more deployment architectures that address the key topics and the collaboration models.

4. Map the key topics to basic functions and develop high-level call flows.

5. Identify the issues that need to be solved.

6. Provide candidate solutions (including call flows) for each of the identified issues.

7. Coordinate work with other 3GPP groups e.g. SA2, SA3, SA5, and others as needed.

8. Coordinate work with external organizations such as DASH-IF, CTA WAVE, ISO/IEC JTC29 WG3 (MPEG Systems), or IETF, as needed.

9. Identify gaps and recommend potential normative work for stage-2 call flows and possibly stage-3.

## ===== 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*.

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## 3.3 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [1].

API Application Programming Interface

CDN Content Delivery Network

DS Differentiated Service

EAS Edge Application Server

EES Edge Enabler Server

FAR Forward Action Rule

MAR Multi-Access Rule

NRF Network Repository Function

PDR Packet Detection Rule

PFCP Packet Forwarding Control Protocol

QER QoS Enforcement Rule

QLOG QUIC Logging

PHB Per-Hop Behaviour

PFD Packet Flow Description

SDF Service Data Flow

URL Uniform Resource Locator

URR Usage Reporting Rule

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# 4 5G Media Streaming

The 5G Media Streaming architecture is defined in TS 26.501 [15].

Protocols and APIs are specified in TS 26.512 [16], with reference to the generalized media session handling operations and APIs specified in TS 26.510 [26510].

Profiles, codecs and formats are provided in TS 26.511 [96].

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## 5.15 Media Delivery specification

### 5.15.1 Description

The primary focus of a new 3GPP Technical Specification or updates to TS 26.512 [26512] is the delivery of segmented media objects in the media plane, i.e. at reference points M2, M3, M4, M7, M11 and M12 of the Media Delivery architecture as shown in figure 5.15.1-1.



Figure 5.15.1-1 Media Delivery Architecture as defined in TS 26.501 [15] with emphasis for protocol specification (M2, M3, M4, M7, M11 and M12) to be developed.

Such a specification is expected to address interoperability considerations around content delivery protocol features and general technologies for segmented media streaming and the IP/PDU 5G System Layer. This points to the further study of media plane issues to support additional functionalities, but also identifies what would need to be ported from TS 26.512 [16] to a generalised media plane technical specification. The relation to media session handling (as specified in TS 26.510 [26510]) is also relevant, but not the focus of a new specification.

Reference point M12 is not in scope for this Key Issue and the proposed new specification; the focus is on reference point M4 between the Media AS and the Media Access Function of the Media Client on the UE.

Key aspects of such a specification should include common protocols at referenc points M2 and M4, as well as common APIs on M7 and M11. In addition, consistent extensions to such protocols need to be reviewed, for example custom HTTP headers, query parameters, etc.

### 5.15.2 General outline of specification

The following outline is considered for a new Technical Specification addressing the media plane.

1 Scope

2 References

3 Definitions

4 Overview and Assumptions

4.1 General Assumptions and Protocol Stack for M2 and M4: IPv4 or IPv6 and HTTP according to RFC 9110

- HTTP/1.1, TLS (optional), TCP, IP – parallel requests, RFC 9112

- HTTP/2, TLS, TCP, IP – one TCP connection, RFC 9113

- HTTP/3, QUIC (+TLS), UDP, IP – one QUIC connection, RFC 9114

- HTTP Methods

- HTTP Headers

4.2 General Assumptions for M7 and M11

- Existence of a reference API in Media Access function

4.3 General Assumptions for M3

- Existence of a reference API in Media AS

4.4 Features

- What are features?

- Configurable UE and Media AS functionalities.

- Features may be mandatory or optional, but are typically optional

- Features are fully specified and normative

- How can the features be configured?

- What are the requirements for each feature?

- Overview of features and mapping to reference points

5 General Procedures for Functions and Reference Points

Editor’s Note: do we want to differentiate uplink and downlink streaming?

- Media AS

- Overview

- Reference Point M2

- Reference Point M3

- Reference Point M4

- Media Access Client

- Overview

- Reference Point M4

- Reference Point M7

- Reference Point M11

6 Media Delivery Features

Editor’s Note: as an alternative, reference points are the top headings and then we add to each reference point what the feature needs to support.

- For each feature

- Overview

- Procedures (if not in stage-2, possibly referenced)

- Requirements for each function and reference point

- Implementation Guidelines

### 5.15.3 Existing Features

The following features are already documented in other 3GPP specifications, in particular in TS 26.512 [26512].

Editor’s Note: Details are for further study

### 5.15.4 Importing from other specifications

The following information already exists in other specifications

Editor’s Note: Details are for further study

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

## 6.15 Media Delivery Specification

Editor’s Note: Details are for further study