**3GPP TSG-S4 Meeting #126*****S4-231635r01***

**Chicago, United States of America, 13th–17th November 2023**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  | **26.512** | **CR** | **0057** | **rev** |  | **Current version:** | **17.6.0** |  |
|  |
| *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:***  |  |
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| ***Source to WG:*** | BBC |
| ***Source to TSG:*** | S4 |
|  |  |
| ***Work item code:*** | 5GMS\_Pro\_Ph2 |  | ***Date:*** | 2023-11-01 |
|  |  |  |  |  |
| ***Category:*** | **D** |  | ***Release:*** | Rel-18 |
|  | *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-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
|  |  |
| ***Reason for change:*** | The procedures and APIs at reference points M1, M5 and M6 are specified instead in TS 26.510 in Rel-18. |
|  |  |
| ***Summary of change:*** | Removal of affected procedures, API specifications and OpenAPI definitions. In some clauses, a forward reference to TS 26.510 is provided; in other cases the clause is simply voided. |
|  |  |
| ***Consequences if not approved:*** | Procedures and APIs will be specified redundantly (and possibly inconsistently) in two different Technical Specifications in Rel‑18. |
| ***Q*** |  |
| ***Clauses affected:*** | 2, 4.3.1, 4.3.2, 4.3.3, 4.3.3A (new), 4.3.4, 4.3.5, 4.3.6, 4.3.7, 4.3.8, 4.3.9, 4.3.10, 4.3.11, 4.7.1, 4.7.2, 4.7.3, 4.7.4, 4.7.5, 4.7.6, 4.8.2, 6.1 (voided), 6.2.1.1, 6.2.2, 6.2.3.1, 6.2.3.2.1, 6.2.3.2.2, 6.2.3.4, 6.2.3.5, 6.3 (voided), 6.4.2, 6.4.3.1, 6.4.3.4 (voided), 6.4.3.5 (voided), 6.4.3.6 (voided), 6.4.3.7 (voided), 6.4.3.8 (voided), 6.4.4.1 (voided), 6.4.4.2 (voided), 6.4.4.4 (voided), 6.4.4.5 (renumbered), 6.5 (voided). 7.2.1, 7.2.2 (voided), 7.2.3 (voided), 7.3.1, 7.3.2 (voided), 7.3.3 (voided), 7.4.1, 7.4.2 (voided), 7.4.3 (voided), 7.4.4 (voided), 7.5.1, 7.5.2 (voided), 7.5.3 (voided), 7.6.1, 7.6.2 (voided), 7.6.3 (voided), 7.6.4 (voided), 7.6A (new), 7.7.1, 7.7.2 (voided), 7.7.3 (voided), 7.8.1, 7.8.2 (voided), 7.8.3 (voided), 7.9.1, 7.9.2 (voided), 7.9.3 (voided), 7.10.1, 7.10.2 (voided), 7.10.3 (voided), 7.11.1, 7.11.2 (voided), 7.11.3 (voided), 11.2.1, 11.2.2 (voided), 11.2.3 (voided), 11.3.1, 11.3.2 (voided), 11.3.3 (voided), 11.4.1, 11.4.2 (voided), 11.4.3, 11.5.1, 11.5.2 (voided), 11.5.3 (voided), 11.5.4 (voided), 11.6.1, 11.6.2 (voided), 11.6.3 (voided), 11.6.4 (voided), 12.2, 12.2.1, 12.2.2 (voided), 12.2.3 (voided), 12.2.4 (voided), 12.2.5 (voided), 12.2.6 (voided), 12.2.7 (voided), 12.3, 15.1, 15.2 (voided), 15.3 (voided), 16.1, 16.2 (voided), 16.3 (voided), C.2, C.3 (voided), C.4 (voided), D (voided) |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications |  |
| ***affected:*** |  | **X** |  Test specifications |  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications |  |
|  |  |
| ***Other comments:*** | Voided clauses are intended to be ported to TS 26.510 in the next meeting cycle. |
|  |  |
| ***This CR’s revision history:*** |  |

FIRST CHANGE

# 2 References

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

…

[52] …

[53] …

[54] …

[55] 3GPP TS 26.510: "Media delivery; interactions and APIs for provisioning and media session handling".

Next change

## 4.3 Procedures of the M1 (5GMS Provisioning) interface

### 4.3.1 General

A 5GMS Application Provider may use the procedures in this clause to provision the network for media streaming sessions that are operated by that 5GMS Application Provider. For downlink media streaming, these sessions may be DASH streaming sessions, progressive download sessions, or any other type of media streaming or distribution (e.g. HLS) sessions. For uplink media streaming, the content format and delivery protocol are defined by the 5GMSu Application Provider, and may be either non-fully standardized or employ standardized HTTP-based streaming of ISO BMFF content fragments as profiled by CMAF [39].

Reference point M1 offers three different sets of procedures:

- For downlink media streaming, configuration of content ingest at reference point M2d for onward distribution by the 5GMSd AS over reference point M4d or via other distribution systems such as eMBMS. The API at this reference point is designed to offer equivalent functionality as that exposed by a public CDN. For uplink media streaming, configuration of content egest at reference point M2u for the media content received by the 5GMSu AS from the 5GMSu Client over M4u. The resource types involved in content hosting configuration are provisioning session (see clause 4.3.2), content hosting procedures (see clause 4.3.3), ingest protocols (see clause 4.3.4), content preparation template (see clause 4.3.5), and server certificates (see clause 4.3.6).

- Configuration of dynamic policies: allows the configuration of Policy Templates at M5 that can be applied to M4 downlink/uplink media streaming sessions.

- Configuration of reporting: permits the MNO to collect, at M5, QoE metrics and consumption reports about M4 downlink sessions, as well as permits the MNO to collect, at M5, QoE metrics reports about M4 uplink sessions.

A 5GMS Application Provider may use any of these procedures, in any combination, to support its media streaming sessions.

### 4.3.2 Provisioning Session procedures

#### 4.3.2.1 General

Prior to configuring content hosting, dynamic policies, or reporting, the 5GMS Application Provider shall create a new Provisioning Session in the 5GMS AF. The 5GMS Application Provider shall use the operations specified in clause 5.2.3 of TS 26.510 [55] at reference point M1 to create and subsequently manipulate Provisioning Sessions in the 5GMS AF.

#### 4.3.2.2 Void

#### 4.3.2.3 Void

#### 4.3.2.4 Void

#### 4.3.2.5 Void

### 4.3.3 Content Hosting provisioning procedures

#### 4.3.3.1 General

The 5GMSd Application Provider shall use the operations specified in clause 5.2.8 of TS 26.510 [54] at reference point M1d when it wants to create and subsequently manipulate Content Hosting Configurations in the 5GMSd AF in order to provision the content hosting feature for downlink media streaming.

#### 4.3.3.2 Void

#### 4.3.3.3 Void

#### 4.3.3.4 Void

#### 4.3.3.5 Void

#### 4.3.3.6 Void

### 4.3.3A Content Publishing provisioning procedures

#### 4.3.3A.1 General

The 5GMSu Application Provider shall use the operations specified in clause 5.2.9 of TS 26.510 [54] at reference point M1u when it wants to create and subsequently manipulate Content Publishing Configurations in the 5GMSu AF in order to provision the content publishing feature for uplink media streaming.

### 4.3.4 Content Protocols Discovery procedures

#### 4.3.4.1 General

The 5GMS Application Provider shall use the operations specified in clause 5.2.2 of TS 26.510 [54] at reference point M1 when it wants to discover the set of downlink content ingest or uplink content egest protocols supported by the 5GMS AS at reference point M2.

#### 4.3.4.2 Void

#### 4.3.4.3 Void

#### 4.3.4.4 Void

#### 4.3.4.5 Void

### 4.3.5 Content Preparation Template provisioning procedures

#### 4.3.5.1 General

For downlink media streaming, the 5GMSd AS may be required to process content ingested at interface M2d before serving it on interface M4d. For uplink media streaming, the 5GMSu AS may be required to process content it receives from the 5GMSu Client before passing it to the 5GMSu Application Provider on the egest interface M2u.

The 5GMS Application Provider shall use the operations specified in clause 5.2.5 of TS 26.510 [54] at reference point M1 when it wants to create and subsequently manipulate Content Preparation Templates in the 5GMS AF.

#### 4.3.5.2 Void

#### 4.3.5.3 Void

#### 4.3.5.4 Void

#### 4.3.5.5 Void

### 4.3.6 Server Certificate provisioning procedures

#### 4.3.6.1 General

Each X.509 server certificate [8] presented by the 5GMSd AS at reference point M4d or at reference point xMB-U is represented by a Server Certificate resource at M1d. The 5GMS Application Provider shall use the operations specified in clause 5.2.4 of TS 26.510 [54] at reference point M1 when it wants to create and subsequently manipulate Server Certificates in the 5GMS AF. These enable a Server Certificate resource to be created within the scope of a Provisioning Session, and subsequently referenced by a Content Hosting Configuration created in the scope of the same Provisioning Session.

NOTE: As a consumer of media from the 5GMSd AS in a combined architecture using 5GMS and eMBMS, the BM‑SC needs to be able to trust the content it is receiving comes from a *bona fide* source. This issue is left to implementation.

#### 4.3.6.2 Void

#### ’4.3.6.3 Void

#### ’4.3.6.4 Void

#### 4.3.6.5 Void

#### 4.3.6.6 Void

#### 4.3.6.7 Void

### 4.3.7 Dynamic Policy provisioning procedures

#### 4.3.7.1 General

The 5GMS Application Provider shall use the operations specified in clause 5.2.7 of TS 26.510 [54] at reference point M1 when it wants to create and subsequently manipulate Policy Templates available for the use of downlink or uplink media streaming sessions of a particular Provisioning Session in the 5GMS AF.

#### 4.3.7.2 Void

#### 4.3.7.3 Void

#### 4.3.7.4 Void

#### 4.3.7.5 Void

### 4.3.8 Consumption Reporting Configuration provisioning procedures

#### 4.3.8.1 General

The 5GMSd Application Provider shall use the interactions specified in clause 5.2.11 of TS 26.510 [54] at reference point M1 when it wants to activate and configure consumption reporting for a Provisioning Session in the 5GMSd AF.

#### 4.3.8.2 Void

#### 4.3.8.3 Void

#### 4.3.8.4 Void

#### 4.3.8.5 Void

### 4.3.9 Metrics Reporting provisioning procedures

#### 4.3.9.1 General

The 5GMS Application Provider shall use the operations specified in clause 5.2.10 of TS 26.510 [54] at reference point M1 when it wants to configure QoE metrics reporting functionality associated with a downlink or uplink media streaming Provisioning Session in the 5GMS AF.

#### 4.3.9.2 Void

#### 4.3.9.3 Void

#### 4.3.9.4 Void

#### 4.3.9.5 Void

### 4.3.10 Edge Resources provisioning procedures

#### 4.3.10.1 General

The 5GMS Application Provider shall use the operations specified in clause 5.2.6 of TS 26.510 [54] at reference point M1 when it wants to provision edge resources for downlink or uplink media streaming associated with a Provisioning Session in the 5GMS AF.

NOTE: The requirements on an edge-enabled 5GMS AF are defined in clause 4.5.2 of TS 26.501 [2].

#### 4.3.10.2 Void

#### 4.3.10.3 Void

#### 4.3.10.4 Void

#### 4.3.10.5 Void

### 4.3.11 Event Data Processing provisioning procedures

#### 4.3.11.1 General

The 5GMS Application Provider shall use the operations specified in clause 5.2.12 of TS 26.510 [54] at reference point M1 to configure the collection and processing of UE data related to 5G Media Streaming and to restrict its exposure over reference points R5 and R6 by configuring the Data Collection AF instantiated in the 5GMS AF (as defined in TS 26.531 [46] and clause 4.7 of TS 26.501 [2]) with one or more Event Data Processing Configurations and Data Access Profiles for a particular Event ID.

Each instance of a Data Access Profile specifies a set of data processing operations to be performed by the Data Collection AF on its collected UE data in order to synthesize the event data to be exposed to a specific Event service consumer entity. In this release, eligible Event service consumer entities of 5GMS event data are the NWDAF, the Event Consumer AF and the NEF.

#### 4.3.11.2 Void

#### 4.3.11.3 Void

#### 4.3.11.4 Void

Next change

## 4.7 Procedures of the M5 (Media Session Handling) interface

### 4.7.1 Introduction

The procedures at reference point M5 are used by a Media Session Handler within a 5GMS Client to invoke services relating to downlink or uplink media streaming on the 5GMS AF.

### 4.7.2 Procedures for Service Access Information

#### 4.7.2.1 General

Service Access Information is the set of parameters and addresses needed by the 5GMSd Client to activate reception of a downlink media streaming session or by a 5GMSu Client to activate an uplink media streaming session for contribution. Service Access Information additionally includes configuration information to allow the Media Session Handler to invoke procedures for dynamic policy (see clause 4.7.3), consumption reporting (clause 4.7.4), metrics reporting (clause 4.7.5) and network assistance (clause 4.7.6).

The Media Session Handler may obtain Service Access Information from either the 5GMS-Aware Application (via reference point M6) or from the 5GMS AF (via reference point M5). In the former case, the Service Access Information is initially acquired by the 5GMS-Aware Application from the 5GMS Application Provider via reference point M8. In the latter case, the Media Session Handler shall use the operations specified in clause 5.3.2 of TS 26.510 [54] at reference point M5 to acquire Service Access Information from the 5GMS AF, citing an external service identifier and the Service Access Information is derived by the 5GMS AF from the Provisioning Session established at reference point M1 (see clause 4.3.2) that is tagged with the same external service identifier.

Typically, the Service Access Information for downlink media streaming includes a media entry point (e.g. a URL to a DASH MPD or a URL to a progressive download file) that can be consumed by the Media Player and is handed to the Media Player through M7d.

If an Edge Resources Configuration with client-driven management (EM\_CLIENT\_DRIVEN) is provisioned in the applicable Provisioning Session, the 5GMS AF shall convey a Client Edge Resources Configuration to the Media Session Handler as part of the Service Access Information it provides at reference point M5.

NOTE: The requirements on an edge-enabled Media Session Handler are defined in clause 4.5.2 of TS 26.501 [2].

For downlink media streaming exclusively via eMBMS and for hybrid 5GMSd/eMBMS services as defined in clauses 5.10.2 and 5.10.5 respectively of TS 26.501 [2], the Service Access Information indicates that the 5GMSd Client acts as an MBMS-Aware Application.

For dynamically provisioned downlink media streaming via eMBMS as defined in clause 5.10.6 of TS 26.501 [2], the 5GMSd AS creates a presentation manifest that is regularly polled by the Media Player for a potential update. When an eMBMS User Service carrying the 5GMSd content is dynamically provisioned or removed by the 5GMSd AF, the 5GMSd AS shall update the presentation manifest with the locations where the updated manifest and the media segments are now available, for example to add or change to the media server in the MBMS Client.

#### 4.7.2.2 Void

#### 4.7.2.3 Void

#### 4.7.2.4 Void

#### 4.7.2.5 Void

### 4.7.3 Procedures for dynamic policy invocation

These procedures are used by a Media Session Handler to manage Dynamic Policy Instance resources in the 5GMS AF. To do this, the Media Session Handler shall use the operations specified in clause 5.3.3 of TS 26.510 [54] at reference point M5 to instantiate Policy Templates in the 5GMS AF that are described in the Dynamic Policy Configuration provided in the Service Access Information (see clause 4.7.2).

### 4.7.4 Procedures for consumption reporting

These procedures are used by the Media Session Handler and the Consumption Reporting function of the 5GMSd Client to submit a consumption report to the 5GMSd AF via reference point M5d if consumption reporting is applied for a downlink media streaming session. This is indicated by the presence of a Client Consumption Reporting Configuration in the Service Access Information. To determine whether and how to send consumption reports to the 5GMSd AF at reference point M5, the Media Session Handler shall use the procedures and operations specified in clause 5.3.6 of TS 26.510 [54].

### 4.7.5 Procedures for metrics reporting

These procedures are used by the Media Session Handler and the Metrics Reporting function of the 5GMS Client to submit a QoE metrics report to the 5GMS AF via reference point M5 if metrics reporting is applied for a media streaming session. To determine whether and how to send metrics reports the 5GMSd AF at reference point M5, the Media Session Handler shall use the procedures and operations specified in clause 5.3.5 of TS 26.510 [54].

When the metrics collection and reporting feature is provisioned for a media streaming Provisioning Session, one or more Client Metrics Reporting Configurations, each associated with a metrics scheme, are provided to the 5GMS Client in the Service Access Information (see clause 4.7.2).

* For progressive download and DASH streaming services, the listed metrics in a given Client Metrics Reporting Configuration are associated with the 3GPP metrics scheme and shall correspond to one or more of the metrics as specified in clauses 10.3 and 10.4, respectively, of TS 26.247 [4].
* Metrics related to virtual reality media, as specified in clause 9.3 of TS 26.118 [42], may be listed in a Client Metrics Reporting Configuration.
* Metrics related to eMBMS delivery, as specified in clause 9.4.6 of TS 26.346 [51], may be listed in a Metrics Reporting Configuration.

### 4.7.6 Procedures for network assistance

These procedures are used by the 5GMS Client to request Network Assistance from one of the 5GMS AF instances listed in the Network Assistance Configuration of the Service Access Information. To do this, the Media Session Handler shall use the procedures and operations specified in clause 5.3.4 of TS 26.510 [54] at reference point M5.

## 4.8 Procedures of the M6d (UE Media Session Handling) interface

### 4.8.1 General

This clause contains the procedures for the interaction between the 5GMSd-Aware application or the Media Player and the Media Session Handler through the M6d API. Details are provided in clause 12.

### 4.8.2 Consumption reporting procedures

When consumption reporting for this session is active for a given media delivery session, the Media Session Handler and Media Streamer (downlink Media Player or uplink Media Streamer) shall follow the procedures specified in clause 5.4.6 of TS 26.510 [54] to support consumption reporting.

Next change

## 6.1 Void

“”Next change

## 6.2 Usage of HTTP

### 6.2.1 HTTP protocol version

#### 6.2.1.1 5GMS AF

Implementations of the 5GMS AF shall comply with clause 7.1.1 of TS 26.510 [54].

#### 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.

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 C of the present document and in annex A of TS 26.510 [54].

### 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 all versions of HTTP.

#### 6.2.3.2 User Agent identification

##### 6.2.3.2.1 Media Stream Handler identification

The Media Stream Handler in the 5GMS Client shall identify itself to the 5GMS AS at reference point M4 using a User-Agent request header (see section 5.5.3 of RFC 7231 [25]) that should include the product token 5GMS‌Media‌Stream‌Handler. If this product identifier is supplied, the optional product-version suffix shall be present. This should indicate the version number of the present document (without the leading “V”) with which the Media Stream Handler implementation complies and shall, at minimum, indicate the 3GPP release number with which the implementation complies.

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

EXAMPLE 1: 5GMSMediaStreamHandler/17.5.0 (build2634) ExoPlayerLib/2.17.1

EXAMPLE 2: 5GMSMediaStreamHandler/17

##### 6.2.3.2.2 Media Session Handler identification

The Media Session Handler in the 5GMS Client shall identify itself to the 5GMS AF at reference point M5 using a User-Agent request header (see section 5.5.3 of RFC 7231 [25]) in which the first element shall be a product identified by the token 5GMSMediaSessionHandler. The optional product-version suffix shall be present. This should indicate the version number of the present document (without the leading “V”) with which the Media Session Handler implementation complies and shall, at minimum, indicate the 3GPP release number with which the implementation complies.

The Media Session Handler may supply additional vendor-specific product identifiers in the User-Agent request header and may additionally supply a comment element containing vendor-specific information.

EXAMPLE 1: 5GMSMediaSessionHandler/17.5.0 (build1536) lib5gmsclient/0.3.1

EXAMPLE 2: 5GMSMediaSessionHandler/17

#### 6.2.3.3 Server identification

##### 6.2.3.3.1 5GMS AF identification

The 5GMS AF shall identify itself at reference points M1 and M5 using a Server response header (see section 7.4.2 of RFC 7231 [25]) that includes a product string of the following form:

5GMSAF-{FQDN}/{complianceInformation}

where {FQDN} shall be the Fully-Qualified Domain Name of the 5GMSd AF exposed to the requesting client, and {complianceInformation} should indicate the version number of the present document (without the leading “V”) with which the 5GMS AF implementation complies and shall, at minimum, indicate the 3GPP release number with which the implementation complies.

The Server response header may also include comments strings and vendor-specific subproduct strings compliant with the syntax and guidance provided in section 7.4.2 of [25].

EXAMPLE 1: 5GMSAF-vm10664.mno.net/17.4.0 (api=2.1.0) libsbi/2.1 libnf/1.2 libaf/1.1

EXAMPLE 2: 5GMSAF-vm10664.mno.net/17 (api=2.1.0) libsbi/2.1 libnf/1.2 libaf/1.1

#### 6.2.3.4 Support for conditional HTTP GET requests

All responses from the 5GMS AF that carry a resource message body shall comply with clause 7.1.4.2 of TS 26.510 [54].

#### 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 comply with clause 7.1.4.3 of TS 26.510 [54].

Next change

## 6.3 Void

Next change

### 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 |
| ResourceId | string | String chosen by the 5GMS AF to serve as an identifier in a resource URL. |  |
|  |  |  |  |
| Url | string | Uniform Resource Locator, conforming with the URI Generic Syntax. | IETF RFC 3986 [41] |
| Percentage | number | A percentage expressed as a floating point value between 0.0 and 100.0 (inclusive). |  |
|  |  |  |  |
| DateTime | string | An absolute date and time expressed using the OpenAPI date-time string format. | TS 29.571 [12] table 5.2.2‑1 |
| Ipv4Addr | string | Ipv4 address formatted in “dotted decimal” notation | TS 29.571 [12] table 5.2.2‑1. |
| Ipv6Addr | string | Ipv6 address formatted in colon-separated hexadecimal quartet notation. | TS 29.571 [12] table 5.2.2‑1. |
| Uinteger | Integer | Unsigned integer. | TS 29.571 [12] table 5.2.2‑1. |

Next change

### 6.4.3 Structured data types

#### 6.4.3.1 IpPacketFilterSet type

Table 6.4.3.1-1: Definition of type IpPacketFilterSet

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Property name | Data type | Cardinality | Usage | Description |
| srcIp | String | 0..1 |  | Source IP address or Ipv6 prefix. |
| dstIp | String | 0..1 |  | Destination IP address or Ipv6 prefix. |
| Protocol | Integer | 0..1 |  | Protocol. |
| srcPort | Integer | 0..1 |  | Source port. |
| dstPort | Integer | 0..1 |  | Destination Port. |
| toSTc | String | 0..1 |  | Type of Service (TOS) (Ipv4) / Traffic class (Ipv6) and Mask. |
| flowLabel | Integer | 0..1 |  | Flow Label (Ipv6). |
| Spi | Integer | 0..1 |  | Security Parameter Index. |
| Direction | String | 1..1 |  | Packet Filter Set Direction. |

#### 6.4.3.2 ServiceDataFlowDescription type

Table 6.4.3.2-1: Definition of type ServiceDataFlowDescription

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Property name | Data type | Cardinality | Usage | Description |
| flowDescription | IpPacketFilterSet | 0..1 |  | Service Data Flow Description. |
| domainName | string | 0..1 |  | FQDN of the 5GMS AS. |
| NOTE: Exactly one property shall be populated in objects of this type. |

#### 6.4.3.3 M5QoSSpecification type

Table 6.4.3.2-1: Definition of type M5QoSSpecification

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Property name | Data type | Cardinality | Usage | Description |
| marBwDlBitRate | BitRate | 1..1 |  | Maximum requested bit rate for the Downlink. |
| marBwUlBitRate | BitRate | 1..1 |  | Maximum requested bit rate for the Uplink. |
| minDesBwDlBitRate | BitRate | 0..1 |  | Minimum desired bit rate for the Downlink. |
| minDesBwUlBitRate | BitRate | 0..1 |  | Minimum desired bit rate for the Uplink. |
| mirBwDlBitRate | BitRate | 1..1 |  | Minimum requested bit rate for the Downlink. |
| mirBwUlBitRate | BitRate | 1..1 |  | Minimum requested bandwidth for the Uplink. |
| desLatency | Integer | 0..1 |  | Desire Latency. |
| desLoss | Integer | 0..1 |  | Desired Loss Rate. |

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#### 6.4.3.4 Void6.4.3.5 Void6.4.3.6 Void6.4.3.7 Void6.4.3.8 Void6.4.3.9 EndpointAddress type

Table 6.4.3.9-1: Definition of EndpointAddress type

| Property name | Type | Cardinality | Description |
| --- | --- | --- | --- |
| domainName | string | 0..1 | Internet domain name of the endpoint. |
| Ipv4Addr | Ipv4Addr | 0..1 | Ipv4 address of the endpoint. |
| Ipv6Addr | Ipv6Addr | 0..1 | Ipv6 address of the endpoint. |
| portNumber | Uinteger | 1 | Port number of the endpoint. |
| NOTE: Either domainName or at least one of ipv4Addr or ipv6Addr shall be present. |

### 6.4.4 Enumerated data types

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#### 6.4.4.1 Void6.4.4.2 Void6.4.4.3 ProvisioningSessionType enumeration

The data model for the ProvisioningSessionType enumeration is specified in Table 6.4.4.3-1 below:

Table 6.4.4.3‑1: Definition of ProvisioningSessionType enumeration

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| Enumeration value | Description |
| DOWNLINK | Downlink media streaming |
| UPLINK | Uplink media streaming |

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#### 6.4.4.4 Void6.4.4.5 CacheStatus enumeration

Table 6.4.4.4‑1: Definition of CacheStatus enumeration

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| Enumeration value | Description |
| HIT | The requested object is present in the 5GMS AS cache and is still valid. |
| MISS | The requested object is not present in the 5GMS AS cache. |
| EXPIRED | The requested object is present in the 5GMS AS cache but is stale. |

Next change

## 6.5 Void

“”“”“”“”“”“”“”“”“”Next change

# 7 Provisioning (M1) APIs

## 7.1 General

This clause defines the provisioning API used by a 5GMS Application Provider to configure downlink or uplink 5G Media Streaming services.

## 7.2 Provisioning Sessions API

### 7.2.1 Overview

The API used by the 5GMS Application Provider to instantiate and manipulate downlink or uplink media streaming Provisioning Sessions in the 5GMS AF at reference point M1 is specified in clause 8.3 of TS 26.510 [54]. Having created a Provisioning Session, the 5GMS Application Provider then goes on to provision other 5GMS features in the context of this Provisioning Session, using the APIs specified in clause 7.3 *et seq*. Certain of these features are only applicable to the type of Provisioning Session created.

### 7.2.2 Void

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## 7.2.3 Void7.3 Server Certificates Provisioning API

### 7.3.1 Overview

The API used by the 5GMS Application Provider at reference point M1 to instantiate and manipulate Server Certificates associated with a particular downlink or uplink media streaming Provisioning Session in the 5GMS AF is specified in clause 8.4 of TS 26.510 [54]. It is used to provision X.509 [8] server certificates that can be referenced by a Content Hosting Configuration and subsequently presented by the 5GMSd AS when it distributes content to 5GMSd Clients at interface M4d using Transport Layer Security [30]. Server Certificate resources are provisioned within the scope of an enclosing Provisioning Session.

### 7.3.2 Void

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### 7.3.3 Void

## 7.4 Content Preparation Templates Provisioning API

### 7.4.1 Overview

The API used by the 5GMS Application Provider at reference point M1 to instantiate and manipulate Content Preparation Templates associated with a particular downlink or uplink media streaming Provisioning Session in the 5GMS AF is specified in clause 8.5 of TS 26.510 [54]. Content Preparation Templates are used to specify manipulations applied by a 5GMS AS to downlink media resources ingested at interface M2d for distribution at interface M4d, or to uplink media resources contributed at interface M4u for egest at interface M2u. The Content Preparation Templates Provisioning API is used to provision a Content Preparation Template within the scope of a Provisioning Session that can subsequently be referenced from a Content Hosting Configuration.

### 7.4.2 Void

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### 7.4.3 Void

### 7.4.4 Void

## 7.5 Content Protocols Discovery API

### 7.5.1 Overview

The API used by the 5GMS Application Provider at reference point M1 to discover which content ingest or egest protocols are supported by the 5GMS AS instance(s) associated with a 5GMS AF is specified in clause 8.2 of TS 26.510 [54].

- One of the supported ingest protocols may subsequently be provisioned in a Content Hosting Configuration for downlink media streaming (see clause 7.6).

- One of the supported egest protocols may subsequently be provisioned in a Content Publication Configuration for uplink media streaming (see clause 7.6A).

### 7.5.2 Void

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### 7.5.3 Void

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## 7.6 Content Hosting Provisioning API

### 7.6.1 Overview

The API used by the 5GMSd Application Provider at reference point M1d to create and manipulate the 5GMSd AS Content Hosting Configuration associated with a particular downlink media streaming Provisioning Session in the 5GMSd AF is specified in clause 8.8 of TS 26.510 [54].

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### ’’’’““””““””““””7.6.4 Void

## ’’itherither““””’’““””7.6A Content Publishing Provisioning API

### 7.6A.1 Overview

The API used by the 5GMSu Application Provider at reference point M1u to create and manipulate the 5GMSu AS Content Publishing Configuration associated with a particular uplink media streaming Provisioning Session in the 5GMSu AF is specified in clause 8.9 of TS 26.510 [54].

## 7.7 Consumption Reporting Provisioning API

### 7.7.1 Overview

### The API used by the 5GMSd Application Provider at reference point M1d to configure the Consumption Reporting Procedure associated with a particular downlink media streaming Provisioning Session in the 5GMSd AF is specified in clause 8.11 of TS 26.510 [54].7.7.2 Void

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### 7.7.3 Void

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## 7.8 Metrics Reporting Provisioning API

### 7.8.1 Overview

The API used by the 5GMS Application Provider at reference point M1 to instantiate and manipulate Metrics Reporting Configurations associated with a particular downlink or uplink media streaming Provisioning Session in the 5GMS AF is specified in clause 8.10 of TS 25.510 [54].

### 7.8.2 Void

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## 7.9 Policy Templates Provisioning API

### 7.9.1 Overview

The API used by the 5GMS Application Provider at reference point M1 to instantiate and manipulate Policy Templates associated with a particular downlink or uplink media streaming Provisioning Session in the 5GMS AF is specified in clause 8.7 of TS 26.510 [54]. These Policy Template may subsequently be applied to downlink or uplink media streaming sessions belonging to that Application Provider using the Dynamic Policies API specified in clause 11.5. A Policy Template is used to specify the traffic shaping and charging policies to be applied to these media streaming sessions.

### ’7.9.2 Void

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### 7.9.3 Void

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## “”“”7.10 Edge Resources Provisioning API

### 7.10.1 General

The API used by the 5GMS Application Provider at reference point M1 to provision edge resource usage for media streaming sessions associated with a particular downlink or uplink media streaming Provisioning Session in the 5GMS AF is specified in clause 8.6 of TS 26.510 [54]. The information serves as a template to select or instantiate an appropriate 5GMS AS EAS instance that will support the media streaming session at reference point M4.

### 7.10.2 Void

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## 7.11 Event Data Processing Provisioning API

### 7.11.1 General

### The API used by the 5GMS Application Provider at reference point M1 to instantiate and manipulate Event Data Processing Configurations associated with a particular downlink or uplink media streaming Provisioning Session in the Data Collection AF instantiated in the 5GMS AF is specified in clause 8.12 of TS 26.510 [54]. Each such configuration comprises processing rules and parameters expressed by Data Access Profiles each of which defines a level of access by Event consumers to the UE data collected by the Data Collection AF.7.11.2 Void

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# 11 Media Session Handling (M5) APIs

## 11.1 General

This clause defines the Media Session Handling APIs used by the Media Session Handler to access resources exposed by the 5GMS AF at interface M5.

NOTE: While the entirety of the Media Session Handling APIs apply to downlink media streaming, only a subset is applicable to uplink media streaming. Specifically, the Consumption Reporting API is not applicable to uplink media streaming.

## 11.2 Service Access Information API

### 11.2.1 General

The API used by the Media Session Handler to acquire Service Access Information from the 5GMS AF at reference point M5 is specified in clause 9.2 of TS 26.510 [54]. The Service Access Information enables the Media Session Handler to go on to use the other Media Session Handling APIs specified in clause 11.3 *et seq.*

### 11.2.2 Void

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## “”11.3 Consumption Reporting API

### 11.3.1 General

The API used by the Media Session Handler to submit consumption reports to the 5GMS AF at reference point M5 is specified in clause 9.7 of TS 26.510 [54].

### 11.3.2 Void

### 11.3.3 Void

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## 11.4 Metrics Reporting API

### 11.4.1 General

The API used by the Media Session Handler to submit metrics reports to the 5GMS AF at reference point M5 is specified in clause 9.5 of TS 26.510 [54].

NOTE: Multiple metrics configurations may be active at the same time

### 11.4.2 Void

### 11.4.3 Report format

Metrics reports shall be submitted by the Media Session Handler in a format specified by the metrics reporting scheme in question. The Content-Type HTTP request header shall be set in accordance with the relevant metrics reporting scheme specification.

- For downlink media streaming, clauses 10.6.1 and 10.6.2 of TS 26.247 [7] specify the required MIME content type and metrics report format for the 3GPP urn:‌3GPP:‌ns:‌PSS:‌DASH:‌QM10 metrics reporting scheme.

* For virtual reality media the report format is further extended as defined in clause 9.4 of TS 26.118 [42].

In XML documents representing metrics reports for 3GP-DASH downlink media streaming services, the **ReceptionReport**@clientID attribute, if present and is available to the Media Session Handler, should be a GPSI value as defined by TS 23.003 [7]. Otherwise, this attribute should be represented by a stable and globally unique string.

## 11.5 Dynamic Policies API

### 11.5.1 Overview

The API used by the Media Session Handler at reference point M5 to request a specific policy and charging treatment to be applied to a particular application data flow of a downlink or uplink media streaming session by the 5GMS AF is specified in clause 9 of TS 26.510 [54].

### 11.5.2 Void

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### 11.5.3 Void

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### 11.5.4 Void

## 11.6 Network Assistance API

### 11.6.1 Overview

The API used by the Media Session Handler at reference point M5 to obtain bit rate recommendations from the 5GMS AF and to issue delivery boost requests to the 5GMS AF during an ongoing media streaming session is specified in clause 9.4 of TS 26.510 [54].

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### 11.6.3 Void

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### 11.6.4 Void

Next change

# 12 UE Media Session Handling (M6) APIs for uplink and downlink

## 12.1 General

This clause defines the client APIs for Media Session Handling to be used by other 5G System components such as a Media Player in a 5GMSd Client or the Media Streamer in a 5GMSu Client.

NOTE: Client-driven management of edge processing resources via reference point M6 is not specified in this release.

## 12.2 Media session handling for downlink media streaming – APIs and functions

### 12.2.1 Overview

In the following, it is assumed that the Media Session Handler for downlink media streaming adheres to a basic set of functionalities as shown in figure 12.2.1-1.



Figure 12.2.1-1: Usage of M6d in Media Downlink Streaming

The Media Session Handler is considered to run as a service in the background, and is invoked for a media session once a media player in the 5GMSd streaming client is activated with an MPD URL of media MIME type “application/dash+xml”. Based on the MPD URL, the Media Session Handler may initiate communication with the 5GMSd AF through M5d.

NOTE: The initiation of the Media Session Handler for other media types than DASH is for further study.

For an ongoing 5G Media Streaming session, the Media Session Handler is given the following authorizations:

1) The ability to query the status of the Media Player at reference point M7d. For details see clause 13.

2) The ability to process notifications and errors received from the Media Player at reference point M7d. For details see clause 13.

3) The ability to configure certain parameters on the Media Player using methods exposed at reference point M7d. For details see clause 13.

In addition, the Media Session Handler provides information to the 5GMS-Aware Application at reference point M6d, possibly delegated to Media Player at reference point M6d for each of the Media Session Handler functionalities, namely providing:

1) Notification and Error Events;

2) Status Information.

The client API used for downlink media session handling at reference point M6d by the 5GMSd-Aware Application and the Media Player in a 5GMSd Client is specified in clause 10.3 of TS 26.510 [54].

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### 12.2.5

### 12.2.6

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## 12.3 Media session handling for uplink Streaming – APIs and functions

The client API used for uplink media session handling at reference point M6u by the 5GMSu-Aware Application and the Media Streamer in a 5GMSu Client is specified in clause 10.4 of TS 26.510 [54].

Next change

# 15 Miscellaneous UE-internal APIs

## 15.1 General

The use of APIs internal to the UE by the Media Session Handler is specified in clause 11.3 of TS 26.510 [54].

## 15.2 Void

## 15.3 Void

Next change

# 16 Usage of 5GC interfaces and APIs

## 16.1 General

The use of 5GC APIs by the 5GMS AF is specified in clause 11.2 of TS 26.510 [54].

## 16.2 Void

## 16.3 Void

Next change

# C.2 Data Types applicable to several APIs

For the purpose of referencing entities defined in this clause, it shall be assumed that the OpenAPI definitions below are contained in a physical file named "TS26512\_CommonData.yaml".

|  |
| --- |
| openapi: 3.0.0info:  title: 5GMS Common Data Types  version: 3.0.0  description: |    5GMS Common Data Types    *© 2023*, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).    All rights reserved.tags:  - name: 5GMS Common Data Types    description: '5G Media Streaming: Common Data Types'externalDocs:  description: 'TS 26.512 V18.0.0; 5G Media Streaming (5GMS); Protocols'  url: 'https://www.3gpp.org/ftp/Specs/archive/26\_series/26.512/'paths: {}components:  schemas:    #################################    # Clause 6.4.2: Simple data types    #################################    ResourceId:      type: string      description: String chosen by the 5GMS AF to serve as an identifier in a resource URI.    Percentage:      type: number      minimum: 0.0      maximum: 100.0    #Uri is defined in TS29571\_CommonData    Url:      type: string      format: uri-reference      description: 'Uniform Resource Locator, conforming with the "URI-reference" production specified in IETF RFC 3986, section 4.1.'    AbsoluteUrl:      type: string      format: uri      description: 'Absolute Uniform Resource Locator, conforming with the "absolute-URI" production specified in IETF RFC 3986, section 4.3 in which the scheme part is "http" or "https". Note that the "query" suffix is permitted by this production but the "fragment" suffix is not.'    #####################################    # Clause 6.4.3: Structured data types    #####################################    IpPacketFilterSet:      type: object      required:        - direction      properties:        srcIp:          type: string        dstIp:          type: string        protocol:          type: integer        srcPort:          type: integer        dstPort:          type: integer        toSTc:          type: string        flowLabel:          type: integer        spi:          type: integer        direction:          type: string    ServiceDataFlowDescription:      type: object      properties:        flowDescription:          $ref: '#/components/schemas/IpPacketFilterSet'        domainName:          type: string    M5QoSSpecification:      type: object      required:        - marBwDlBitRate        - marBwUlBitRate        - mirBwDlBitRate        - mirBwUlBitRate      properties:        marBwDlBitRate:          $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'        marBwUlBitRate:          $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'        minDesBwDlBitRate:          $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'        minDesBwUlBitRate:          $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'        mirBwDlBitRate:          $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'        mirBwUlBitRate:          $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'        desLatency:          type: integer          minimum: 0        desLoss:          type: integer          minimum: 0    EndpointAddress:      type: object      required:        - portNumber      properties:        hostname:          type: string        ipv4Addr:          $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv4Addr'        ipv6Addr:          $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv6Addr'        portNumber:          $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uint16'    #####################################    # Clause 6.4.4: Enumerated data types    #####################################    ProvisioningSessionType:      anyOf:        - type: string          enum: [DOWNLINK, UPLINK]        - type: string          description: >            This string provides forward-compatibility with future            extensions to the enumeration but is not used to encode            content defined in the present version of this API. CacheStatus: anyOf: - type: string enum: [HIT, MISS, EXPIRED] - type: string description: > This string provides forward-compatibility with future extensions to the enumeration but is not used to encode content defined in the present version of this API. |

Next change

# C.3 OpenAPI representation of the M1 APIs

## C.3.1 Void

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## C.3.2 Void

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## C.3.3 Void

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## C.3.4 Void

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## C.3.5 Void

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## C.3.6 Void

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## C.3.7 Void

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## C.3.8 Void

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## C.3.9 Void

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## C.3.10 Void

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Next change

# C.4 OpenAPI representation of the M5 APIs

## C.4.1 Void

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## C.4.2 Void

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## C.4.3 Void

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## C.4.4 M5\_DynamicPolicies API

This file is specified for the sole purpose of maintaining backwards compatibility for Release 17 of TS 29.517 [46]. The data types it specifies are deprecated and shall not be used in the present release.

|  |
| --- |
| openapi: 3.0.0info:  title: M5\_DynamicPolicies  version: 3.0.0  description: |    5GMS AF M5 Dynamic Policy API    *© 2023*, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).    All rights reserved.tags:  - name: M5\_DynamicPolicies    description: '5G Media Streaming: Media Session Handling (M5) APIs: Dynamic Policies'externalDocs:  description: 'TS 26.512 V18.0.0; 5G Media Streaming (5GMS); Protocols'  url: 'https://www.3gpp.org/ftp/Specs/archive/26\_series/26.512/'paths: {}components:  schemas:    DynamicPolicy:      deprecated: true      description: "A representation of a Dynamic Policy resource."      type: object      required:        - dynamicPolicyId        - policyTemplateId        - serviceDataFlowDescriptions        - provisioningSessionId      properties:        dynamicPolicyId:          $ref: 'TS26512\_CommonData.yaml#/components/schemas/ResourceId'        policyTemplateId:          $ref: 'TS26512\_CommonData.yaml#/components/schemas/ResourceId'        serviceDataFlowDescriptions:          type: array          items:             $ref: 'TS26512\_CommonData.yaml#/components/schemas/ServiceDataFlowDescription'        mediaType:          $ref: 'TS29514\_Npcf\_PolicyAuthorization.yaml#/components/schemas/MediaType'        provisioningSessionId:          $ref: 'TS26512\_CommonData.yaml#/components/schemas/ResourceId'        qosSpecification:          $ref: 'TS26512\_CommonData.yaml#/components/schemas/M5QoSSpecification'        enforcementMethod:          type: string        enforcementBitRate:          type: integer |

## C.4.5 M5\_NetworkAssistance API

This file is specified for the sole purpose of maintaining backwards compatibility for Release 17 of TS 29.517 [46]. The data types it specifies are deprecated and shall not be used in the present release.

|  |
| --- |
| openapi: 3.0.0info:  title: M5\_NetworkAssistance  version: 3.0.0  description: |    5GMS AF M5 Network Assistance API    *© 2023*, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).    All rights reserved.tags:  - name: M5\_NetworkAssistance    description: '5G Media Streaming: Media Session Handling (M5) APIs: Network Assistance'externalDocs:  description: 'TS 26.512 V18.0.0; 5G Media Streaming (5GMS); Protocols'  url: 'https://www.3gpp.org/ftp/Specs/archive/26\_series/26.512/'paths: {}components:  schemas:    NetworkAssistanceSession:      deprecated: true      description: "A representation of a Network Assistance Session resource."      type: object      required:         - naSessionId        - provisioningSessionId        - serviceDataFlowDescriptions      properties:        naSessionId:          $ref: 'TS26512\_CommonData.yaml#/components/schemas/ResourceId'        provisioningSessionId:          $ref: 'TS26512\_CommonData.yaml#/components/schemas/ResourceId'        serviceDataFlowDescriptions:          type: array          items:             $ref: 'TS26512\_CommonData.yaml#/components/schemas/ServiceDataFlowDescription'          minItems: 1        mediaType:          $ref: 'TS29514\_Npcf\_PolicyAuthorization.yaml#/components/schemas/MediaType'        policyTemplateId:          $ref: 'TS26512\_CommonData.yaml#/components/schemas/ResourceId'        requestedQoS:          $ref: 'TS26512\_CommonData.yaml#/components/schemas/M5QoSSpecification'        recommendedQoS:          $ref: 'TS26512\_CommonData.yaml#/components/schemas/M5QoSSpecification'        notficationURL:          $ref: 'TS26512\_CommonData.yaml#/components/schemas/AbsoluteUrl' |

NEXT CHANGE

Annex D (informative):
Void

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END OF CHANGES