**3GPP TSG-S4 Meeting #128*****S4-24xxxx***

**Jeju, Republic of Korea, 20th–24th May 2024** revision of S4-240788

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| *CR-Form-v12.0* |
| **PSEUDO CHANGE REQUEST** |
|  |
|  | **26.510** | **CR** | **—** | **rev** | **—** | **Current version:** | **1.2.3** |  |
|  |
| *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:***  | [5GMS\_Pro\_Ph2] RTC-related additions |
|  |  |
| ***Source to WG:*** | Qualcomm Incorporated, BBC |
| ***Source to TSG:*** | S4 |
|  |  |
| ***Work item code:*** | 5GMS\_Pro\_Ph2 |  | ***Date:*** | 2024-05-XX |
|  |  |  |  |  |
| ***Category:*** | **C** |  | ***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:*** | RTC has a requirement to specify a different QoS for each Service Data Flow in a Dynamic Policy. |
|  |  |
| ***Summary of change:*** | In the *Maf\_Provisioning* service at reference point **M1**:1. Add *pduSetMarking* flag to *M1QosSpecificationType*.
2. Add *pduSetQosLimits* to *M1UnidirectionalQoSSpecification* using *PDUSetQosPara* data type from TS 29.571.

In the *Maf\_SessionHandling* service at reference point **M5**:1. Add *pduSetMarking* flag to Policy Template binding in Service Access Information.
2. Specify new *ApplicationFlowBinding* data type to bind an application flow description to a QoS specification (for use in *DynamicPolicy* resource).
3. Add **media transport parameters for PDU Set identification** to *ServiceDataFlowDescription* using *ProtocolDescription* data type from TS 29.571.
4. Add **desired downlink/uplink PDU Set QoS parameters** to *M5QoSspecification* using *PDUSetQosPara* data type from TS 29.571.

Additionally:1. Rename *ServiceDataFlowDescription* to *ApplicationFlowDescription* in clause 7.3.3.2 and throughout.
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|  |  |
| ***Consequences if not approved:*** | It is necessary to specify a point solution for RTC that is not available to other usages of the Dynamic Policies feature. |
| ***Q*** |  |
| ***Clauses affected:*** | 3.3, 5.2.1, 5.2.7.1, 5.2.10 (new), 5.3.2.1, 5.3.3.1, 5.3.3.2, 5.3.4.2, 5.5.3, 5.5.4, 7.3.3.2, 7.3.3.3, 7.3.3.4, 7.3.3.6, 7.3.3.10, 7.3.3.11, 7.3.3.15 (new), 7.3.4.3, 8.1, 8.2.3.1, 8.10 (new), 9.2.3.1, 9.3.3.1, 9.4.3.1, A.3.9 (new), C.3 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications |  |
| ***affected:*** |  | **X** |  Test specifications |  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications |  |
|  |  |
| ***Other comments:*** | Text for inclusion in TS 26.113 is provided after the change to clause 5.3.3.2. This should be moved to a separate pCR if agreeable. |
|  |  |
| ***This CR's revision history:*** | TS 26.510 pCR [S4-240048]:* Submission for WG endorsement.
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# 3GPP Forge merge request

The code changes associated with this Change Request are available for review at the following URL:

https://forge.3gpp.org/rep/sa4/5gms\_pro\_ph2/-/merge\_requests/XXX/diffs

The proposed changes are reproduced below for posterity:

TBA

Change to TS 26.113

## 10.4 Dynamic Policies API

The Dynamic Policy API allows both the Media Session Handler and the trusted ICE or WebRTC Signalling Function AS to request a specific QoS and charging policy to be applied to the data flows of an RTC session. The resource structure and the data model are specified in clause 9.3 of TS 26.510 [3].

When the Dynamic Policy is used for QoS management of an RTC session's application flows, the qoSSpecification object shall be present in each applicable application flow binding

If PDU Set marking is enabled for the selected Policy Template as specified in clause 5.3.3.2 of TS 26.510 [26510], the Media Session Handler shall populate the ApplicationFlowDescription.mediaTransportParameters property as follows:

- The transportProto property shall be set to the value SRTP.

- The rtpHeaderExt property shall be populated as follows:

- RtpHeaderExtInfo.rtpHeaderExtType shall be set to PDU\_SET\_MARKING.

- RtpHeaderExtInfo.rtpHeaderExtId shall be set to the value of the *ID* field to be used by the RTC endpoint (Media Client) in the *RTP Header Extension for PDU Set Marking* on the application flow in question, as specified in clause 4.2 of TS 26.522 [26522].

- RtpHeaderExtInfo.longFormat shall be set to reflect the use of the one- or two-byte *RTP Header Extension for PDU Set Marking*, as specified in clause 4.2.1 of TS 26.522 [26522].

- RtpHeaderExtInfo.pduSetSizeActive shall be set to reflect the presence of the *PDU Set Size* field in the *RTP Header Extension for PDU Set Marking*, as specified in clause 4.2.4 of TS 26.522 [26522].

- The rtpPayloadInfoList property shall contain a single member populated as follows:

- RtpPayloadInfo.rtpPayloadTypeList shall be set to the *RTP Payload Type* value(s) to be used by the RTC endpoint (Media Client) for the SRTP session(s) carried by the application flow in question.

- RtpPayloadInfo.rtpPayloadFormat shall be omitted.

In all PDUs it contributes to the Media AS at reference point RTC‑4 that fall within the scope of the application flow description, the RTC Access Function (Media Access Function) shall use the protocol indicated in transportProto; it shall set the SRTP header fields in accordance with rtpPayloadInfoList; and it shall include the *RTP Header Extension for PDU Set Marking* in the SRTP header with fields set according to rtpHeaderExt.

First change

## 3.3 Abbreviations

For the purposes of the present document, the abbreviations given in 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 TR 21.905 [1].

…

ICE Interactive Connectivity Establishment

RTC Real-Time (media) Communication

STUN Session Traversal Utilities for NAT, Simple Traversal of User Datagram Protocol (UDP) through Network Address Translators

SWAP Simple WebRTC Application Protocol

TURN Traversal Using Relays around NAT

NEXT CHANGE

## 5.1 Summary

Table 5.1‑1 summarises the APIs used to provision and use the various Media Delivery features specified in TS 26.512 [26512] (designated "5GMS" in the *Applicability* column) and TS 26.113 [26113] (designated "RTC" in the *Applicability* column).

Table 5.1‑1: Summary of APIs relevant to downlink media streaming features

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Media delivery feature | Abstract | Applicability | Reference point | Interactions clause | Relevant APIs |
| API name | API clause |
| Content hosting | Content is ingested, hosted and distributed by the Media AS according to a Content Hosting Configuration associated with a Provisioning Session.The Media AS may be instantiated in an Edge Data Network.Ingested content may additionally be distributed via eMBMS and/or MBS. | 5GMS | M1 | 5.2.2 | Provisioning Sessions API | 8.2 |
| 5.2.3 | Content protocols discovery API | 8.3 |
| 5.2.4 | Server Certificates provisioning API | 8.4 |
| 5.2.5 | Content Preparation Templates provisioning API | 8.5 |
| 5.2.6 | Edge Resources provisioning API | 8.6 |
| 5.2.7 | Policy Templates provisioning API | 8.7 |
| 5.2.8 | Content Hosting provisioning API | 8.8 |
| M5 | 5.4.2 | Service Access Information API | 9.2 |
| Content publishing | Content is contributed to and egested from the Media AS according to a Content Hosting Publishing associated with a Provisioning Session.The Media AS may be instantiated in an Edge Data Network. | 5GMS | M1 | 5.2.2 | Provisioning Sessions API | 8.2 |
| 5.2.3 | Content protocols discovery API | 8.3 |
| 5.2.4 | Server Certificates provisioning API | 8.4 |
| 5.2.5 | Content Preparation Templates provisioning API | 8.5 |
| 5.2.6 | Edge Resources provisioning API | 8.6 |
| 5.2.7 | Policy Templates provisioning API | 8.7 |
| 5.2.9 | Content Publishing provisioning API | 8.9 |
| M5 | 5.4.2 | Service Access Information API | 9.2 |
| Real-Time media Communication (RTC) | Content is exchanged in real-time between RTC endpoints in the Media Client and/or in the Media AS.The Media AS may be instantiated in an Edge Data Network. | RTC | M1 | 5.2.2 | Provisioning Sessions API | 8.2 |
|  |  |  |  | 5.2.4 | Server Certificates provisioning API | 8.4 |
|  |  |  |  | 5.2.6 | Edge Resources provisioning API | 8.6 |
|  |  |  |  | 5.2.7 | Policy Templates provisioning API | 8.7 |
|  |  |  |  | 5.2.10 | Real-Time media Communication Configuration  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| Dynamic Policy instantiation | The Media Client activates different traffic treatment and charging policies, including Background Data Transfer, selected from a set of Policy Templates provisioned in its Provisioning Session. | 5GMS,RTC | M1 | 5.2.3 | Provisioning Sessions API | 8.3 |
| 5.2.7 | Policy Templates provisioning API | 8.7 |
| M5 | 5.4.2 | Service Access Information API | 9.2 |
| 5.4.3 | Dynamic Policies API | 9.3 |
| Network Assistance | The Media Client requests bit rate recommendations and delivery boosts from the Media AF. | 5GMS,RTC | M5 | 5.4.2 | Service Access Information API | 9.2 |
| 5.4.4 | Network Assistance API | 9.4 |
| QoE Metrics reporting | The Media Client submits metrics reports to the Media AF according to a provisioned Metrics Reporting Configuration it obtains from the Service Access Information for its Provisioning Session. | 5GMS,RTC | M1 | 5.2.3 | Provisioning Sessions API | 8.3 |
| 5.2.11 | Metrics Reporting provisioning API | 8.10 |
| M5 | 5.4.2 | Service Access Information API | 9.2 |
| 5.4.5 | Metrics Reporting API | 9.5 |
| Consumption reporting | The Media Client submits consumption reports to the Media AF about content consumed from downlink media delivery sessions according to a provisioned Consumption Reporting Configuration it obtains from the Service Access Information for its Provisioning Session. | 5GMS,RTC | M1 | 5.2.3 | Provisioning Sessions API | 8.3 |
| 5.2.12 | Consumption Reporting provisioning API | 8.11 |
| M5 | 5.4.2 | Service Access Information API | 9.2 |
| 5.4.6 | Consumption Reporting API | 9.6 |
| UE data collection, reporting and exposure | UE data related to media delivery is reported to the Data Collection AF instantiated in the Media AF for exposure to Event consumers. | 5GMS | M1 | 5.2.13 | Event Data Processing provisioning API | 8.12 |
| M5 | 5.4.5 | Metrics Reporting API | 9.5 |
| 5.4.6 | Consumption Reporting API | 9.6 |

NEXT CHANGE

### 5.2.1 Overview

A Media Application Provider may use the operations in this clause to provision the different features offered by the Media Delivery System in the Media AF. The Provisioning API exposed by the Media AF to the Media Application Provider at reference point M1 offers the following sets of operations:

1. Provisioning of *Provisioning Sessions* (see clause 5.2.2) to act as an umbrella for the following provisioning information. Each such Provisioning Session is uniquely identified by a system-dependent Provisioning Session identifier as well as by system-independent service identifier that is subsequently used by a Media-Aware Application to launch media session handling (see clause 10.2) via a 3GPP Service URL (see clause 6).

2. Discovery of the set of content ingest and/or egest protocols supported by the Media AS for a particular Provisioning Session (see clause 5.2.3):

- For downlink media streaming according to TS 26.512 [26512], discovery of the content ingest protocols available at reference point M2 and the content distribution protocols available at reference point M4.

- For uplink media streaming according to TS 26.512 [26512], discovery of the content contribution protocols available at reference point M4 and the content egest protocols available at reference point M2.

3. Provisioning of *Server Certificates* within the scope of a Provisioning Session (see clause 5.2.4) to be used by the Media AS to assert its identity to the Media Access Function in Media Clients during media delivery sessions at reference point M4.

4. Provisioning of *Content Preparation Templates* within the scope of a Provisioning Session (see clause 5.2.5) that can be used by the Media AS to manipulate media content ingested at reference point M2 or contributed at reference point M4.

5. Provisioning of *Edge Resources* within the scope of a Provisioning Session (see clause 5.2.6) to be used to instantiate the Media AS as a set of Edge Application Servers (EAS) in an Edge Data Network (EDN) using the APIs specified in TS 29.558 [29558].

5. Provisioning of *Policy Templates* within the scope of a Provisioning Session (see clause 5.2.7) that can be applied to M4 downlink/uplink media delivery sessions in order to realise different Service Operation Points as part of the Dynamic Policies feature (see clause 5.4.3).

7. Provisioning of media delivery by the Media AS within the scope of a Provisioning Session using the abovementioned building blocks:

- For downlink media streaming according to TS 26.512 [26512], provisioning of the *Content Hosting* feature of the Media AS (see clause 5.2.8), which offers functionality equivalent to that of a public Content Delivery Network (CDN): content ingest at reference point M2 for onward distribution by the Media AS to Media Clients via reference point M4 or via other distribution systems such as eMBMS or MBS.

 After discovering the set of ingest and distribution content protocols supported by the Media AS (see clause 5.2.2), the Media Application Provider may provision a Server Certificate (see clause 5.2.4), Content Preparation Template (see clause 5.2.5) and/or Edge Resources Configuration (see clause 5.2.6) for each Content Hosting distribution configuration to reference. The Media Application Provider may also provision one or more Policy Templates (see clause 5.2.7) to realise Service Operation Points pertaining to downlink media delivery.

- For uplink media streaming according to TS 26.512 [26512], provisioning of the *Content Publishing* feature of the Media AS (see clause 5.2.9), including content contribution by Media Clients at reference point M4 and subsequent content egest of content at reference point M2 after optional manipulation by a Content Preparation Template.

 After discovering the set of contribution and egest content protocols supported by the Media AS (see clause 5.2.2), the Media Application Provider may provision a Server Certificate (see clause 5.2.4), Content Preparation Template (see clause 5.2.5) and/or Edge Resources Configuration (see clause 5.2.6) for each Content Publishing contribution configuration to reference. The Media Application Provider may also provision one or more Policy Templates (see clause 5.2.7) to realise Service Operation Points relevant to the parent Provisioning Session.

- For real-time media communication according to TS 26.113 [26113], provisioning of the RTC functionality of the Media AS (see clause 5.2.12).

 The Media Application Provider may provision WebRTC Signalling, TURN and STUN subfunctions of the Media AS in the Media Delivery System to facilitate communication between Media Clients. Additionally, the Media Application Provider may provision Server Certificates (see clause 5.2.4) for presentation by these subfunctions to Media Clients. Alternatively, the Media Application Provider may provide these subfunctions itself and inform the Media AF of their endpoint addresses at the time of provisioning. The Media Application Provider may additionally provision an Edge Resources Configuration (see clause 5.2.6) for the RTC Configuration to reference. The Media Application Provider may also provision one or more Policy Templates (see clause 5.2.7) for the RTC Configuration to reference that the Media Session Handler is then able to instantiate for RTC-based media delivery sessions.

8. Provisioning of *QoE metrics reporting* within the scope of a Provisioning Session (see clause 5.2.10) to configure how and how often the Media Client should report Quality of Experience metrics to the Media AF during the course of media delivery sessions at reference point M4.

9. Provisioning of *consumption reporting* within the scope of a Provisioning Session (see clause 5.2.11) to configure how often the Media Client should report downlink media consumption to the Media AF during the course of media delivery sessions at reference point M4.

10. Provisioning of rules for processing of UE data (as defined in TS 26.531 [26531]) related to media delivery sessions by the Data Collection AF instantiated in the Media AF (as defined in clause 4.7 of TS 26.501 [26501]), and for restricting its exposure over reference points R5 and R6 by means of Event Data Processing Configurations and Data Access Profiles for a particular Event ID.

NOTE: The *Network Assistance* feature is not provisioned by the Media Application Provider at reference point M1. Instead, it is provisioned at the discretion of the Media Delivery System operator using means beyond the scope of the present document.

NEXT CHANGE

### 5.2.7 Dynamic Policy provisioning

#### 5.2.7.1 General

(Snip)

When a Policy Template is intended to influence the network QoS of Service Data Flows used for media delivery, the qoSSpecification object (of type M1QoSSpecification, see clause 7.3.3.4) shall be present that describes the QoS limits that a Media Client may request when instantiating the Policy Template:

- The qosReference value, as specified in clause 5.6.2.7 of TS 29.514 [29514], is obtained with the Service Level Agreement. See TS 23.502 [23502] for detailed usage.

- The maximumBitRate properties of the downlinkQosSpecification and uplinkQosSpecification objects define the maximal bit rates which are permitted to be requested by a Media Session Handler on (respectively) downlink and uplink Service Data Flows. These values are defined by configuration of the 5G System and are therefore populated by the Media AF rather than by the Media Application Provider.

- The maximumAuthorisedBitRate properties of the downlinkQosSpecification and uplinkQosSpecification objects define the maximal bit rates which a Media Session Handler is authorised to request on (respectively) downlink and uplink Service Data Flows. Higher bit rates are not authorised by the Media Application Provider when the Policy Template is instantiated.

- The minimumPacketLossRate properties of the downlinkQosSpecification and uplinkQosSpecification objects define the minimal packet loss rates which are permitted to be requested by a Media Session Handler on (respectively) downlink and uplink Service Data Flows. Lower packet loss rates are not permitted by the Media Application Provider when the Policy Template is instantiated.

- The pduSetQosLimits properties of the downlinkQosSpecification and uplinkQosSpecification objects define the minimal delay budget and minimal error rates for PDU Sets which are permitted to be requested by a Media Session Handler on (respectively) downlink and uplink Service Data Flows. Lower delay and error rates are not permitted by the Media Application Provider when the Policy Template is instantiated.

- The pduSetMarking flag is used to specify whether Media Clients instantiating this Policy Template are required to apply PDU Set marking to uplink media transport protocol PDUs falling within its scope.

NOTE: PDU Set marking is used by the 5G System to satisfy the QoS requirements of application flows.

When a Policy Template is intended to be used for differential charging, the chargingSpecification property shall be present.

(Snip)

NEXT CHANGE

## 5.2.10 Real-time Media Communication provisioning

#### 5.2.10.1 General

These operations are used by the Media Application Provider at reference point M1 to provision the configuration information for RTC-based media delivery sessions.

HTTP responses for successful and operation-specific failure cases are specified in the following clauses. For all other failure cases, an HTTP response indicating a response code in accordance with clause 7.1.6 shall be returned to the API client. In all failure cases, a message body in accordance with clause 7.1.7 shall be included in the response message.

#### 5.2.10.2 Create Real-time Media Communication Configuration resource operation

This operation is used by the Media Application Provider at reference point M1 to activate the RTC feature for a particular Provisioning Session. The Media Application Provider shall use the HTTP POST method for this purpose. The request URL shall be a well-known sub-resource of the Provisioning Session resource, as specified in clause 8.9.2. The HTTP request message body shall be an RTC Configuration resource representation, as specified in clause 8.10.3.1. There is at most one RTC Configuration resource at a time for a given Provisioning Session.

The Media Application Provider may request that the Media Delivery System provides additional support services to facilitate communication between Media Clients wishing to engage in an RTC-based media delivery session:

- If the enableStunService flag is set to true, the Media AF shall configure the Media AS to provide a STUN service to Media Clients and the Media AF shall populate information about the endpoint(s) of this service in stunServerEndpoints. Otherwise, the Media AS is not required to provide a STUN service. Otherwise, the Media Application Provider may populate stunServerEndpoints with information about a STUN service it provides.

- If the enableTurnService flag is set to true, the Media AF shall configure the Media AS to provide a TURN service to Media Clients and the Media AF shall populate information about the endpoint(s) of this service in turnServerEndpoints. Otherwise, the Media AS is not required to provide a TURN service. Otherwise, the Media Application Provider may populate turnServerEndpoints with information about a TURN service it provides.

- If the enableSwapService flag is set to true, the Media AF shall configure the Media AS to provide a SWAP service to Media Clients and the Media AF shall populate information about the endpoint(s) of this service in swapServer‌Endpoints. Otherwise, the Media AS is not required to provide a SWAP service. Otherwise, the Media Application Provider may populate swapServerEndpoints with information about a SWAP service it provides.

If the operation is successful, the Media AF shall return a 201 (Created) HTTP response message and the request URL shall be returned as the value of the Location HTTP header field. The response message body shall be a representation of the current state of the RTC Configuration resource (see clause 8.10.3.1), including any properties assigned by the Media AF.

If the request is acceptable but the Media AF is unable to provision the resources required by the supplied RTC Configuration, the create operation shall fail with an HTTP response status code of 500 (Internal Server Error) and an error message body per clause 7.1.7. In this case, the RTC Configuration resource shall remain in an uncreated state in the Media AF.

#### 5.2.10.3 Retrieve Real-time Media Communication Configuration resource operation

This operation is used by the Media Application Provider to retrieve the current state of an existing RTC Configuration resource from the Media AF. The HTTP GET method shall be used for this purpose.

If the operation is successful, the Media AF shall return a 200 (OK) response message that includes a representation of the target RTC Configuration resources (see clause 8.10.3.1) in the response message body.

#### 5.2.10.4 Update Real-time Media Communication Configuration resource operation

This operation is invoked by the Media Application Provider to modify the properties of an existing RTC Configuration resource. All writeable properties may be updated. The HTTP PATCH or HTTP PUT methods shall be used for this purpose.

If the HTTP request is acceptable but the operation results in no change to the resource representation, a 204 (No Content) HTTP response message with an empty body should be returned.

If the operation is otherwise successful, the Media AF shall return a 200 (OK) HTTP response message and shall provide a representation of the current state of the target resource in the message body to confirm successful update.

Attempts to modify read-only properties of the target RTC Configuration resource, such as the STUN service endpoint information, shall be rejected by the Media AF with a 403 (Forbidden) HTTP response that includes an error message body per clause 7.1.7.

If the request is acceptable but the Media AF is unable to provision the resources required by the supplied RTC Configuration, the update operation shall fail with an HTTP response status code of 500 (Internal Server Error) and an error message body per clause 7.1.7. In this case the RTC Configuration resource in the Media AF shall remain in the state immediately prior to the update operation.

#### 5.2.10.5 Destroy Real-time Media Communication Configuration resource operation

This operation is used by the Media Application Provider to destroy an RTC Configuration resource. The HTTP DELETE method shall be used for this purpose. As a result, the Media AF will release any associated network resources and invalidate the configuration.

If the procedure is successful, the Media AF shall return a 204 (No Content) HTTP response message with an empty message body.

NEXT CHANGE

### 5.3.2 Service Access Information acquisition

#### 5.3.2.1 General

Service Access Information is the set of parameters and addresses needed by the Media Client to activate reception of a downlink media delivery session, to activate an uplink media delivery session for content contribution or to obtain configuration parameters to initiate real-time media communication (RTC).

The Media Session Handler may obtain Service Access Information in one of two ways:

1. From the Media-aware Application via reference point M6. In this case, the Service Access Information is initially acquired by the Media-aware Application from the Media Application Provider via reference point M8 and the Media-aware Application shall pass the parameters to the Media Session Handler using one of the session launch mechanisms specified in clause 10.2.

2. From the Media AF via reference point M5. In this case, the Service Access Information is derived by the Media AF from a Provisioning Session established at reference point M1 and the Media AF exposes this to the Media Session Handler using the operations specified in this clause. At the start of a media delivery session, a minimal set of baseline Service Access Information parameters is passed to the Media Session Handling using one of the session launch mechanisms specified in clause 10.2 and this causes it to fetch the full Service Access Information from the Media AF using the procedure specified in clause 5.3.2.3.

The data model of the Service Access Information resource acquired by the Media Session Handler of the Media Client is specified in clause 9.2.3.

- Typically, the Service Access Information for media streaming according to TS 26.512 [26512] includes a set of Media Entry Points that can be consumed by the Media Access Function. One of these is selected by the Media Session Handler or by the Media-aware Application and is handed to the Media Access Function via reference point M11 or M7 respectively.

- The Service Access Information for real-time media communication (RTC) according to TS 26.113 [26113] includes information used by the Media Client to configure RTC-based media delivery sessions via the Media AS at reference point M4.

Service Access Information additionally includes configuration information to allow the Media Session Handler to invoke procedures for dynamic policy (see clause 5.3.3), network assistance (clause 5.3.4), QoE metrics reporting (clause 5.3.5) and consumption reporting (clause 5.3.6).

If an Edge Resources Configuration with client-driven management (EM\_CLIENT\_DRIVEN) is provisioned in the applicable Provisioning Session (see clause 5.2.6), the Media 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 for an edge-enabled Media Session Handler are defined in clause 4.5.2 of TS 26.501 [26501].

HTTP responses for successful and operation-specific failure cases are specified in the following clauses. For all other failure cases, an HTTP response indicating a response code in accordance with clause 7.1.6 shall be returned to the API client. In all failure cases a message body in accordance with clause 7.1.7 shall be included in the response message.

NEXT CHANGE

### 5.3.3 Dynamic Policy invocation

#### 5.3.3.1 Procedures

To take advantage of the Dynamic Policy feature of the Media Delivery System, a Media Session Handler instantiates a Policy Template that was previously provisioned within the scope of a Provisioning Session using the operations specified in clause 5.2.7. The parameters in the Policy Template are used by the Media AF in combination with a dynamic QoS specification supplied by the Media Session Handler to request specific QoS and/or charging policies from the PCF (either directly or via the NEF, as specified in clause 5.5.3) for that media delivery session.

The following procedures are followed by a Media Session Handler to manage Dynamic Policy Instance resources in the Media AF via reference point M5. Instantiating a Policy Template as a dynamic policy requires a Policy Template identifier (provided in Service Access Information that is either retrieved from the Media AF using the operation specified in clause 5.3.2.3 or else supplied via reference point M6), a set of Service Data Flow description(s), an optional dynamic QoS specification and potentially other parameters defined in clause 5.7 of TS 26.501 [26501].

- The Policy Template identifier identifies the desired Policy Template (as previously provisioned per clause 5.2.7.3) to be applied to the specified application flow(s). A Policy Template includes properties such as specific QoS (e.g. background data) or different charging treatments.

- The Media AF combines the information from the Policy Template with dynamic QoS specification supplied by the Media Session Handler and uses this complete set of parameters to invoke the PCF according to clause 5.5.3.

- The set of Service Data Flow description(s) allow the identification and classification by the 5G System of the application traffic involved in a media delivery session. These take the form of an IP packet filter set (as defined in clause 5.7.6 of [23501]) or the Fully-Qualified Domain Name (FQDN) of a Media AS at reference point M4.

- The Dynamic Policy Instance may specify a target network slice and Data Network Name.

NOTE: It is not defined in this release how a Media AF in an external Data Network selects a specific DNN or S‑NSSAI.

The Media Session Handler shall not attempt to create more than one Dynamic Policy Instance at a time for any given media delivery session. The application flow specifications for Dynamic Policy Instances relating to concurrent media delivery sessions at the same Media Client shall be non-overlapping. The Media AF is responsible for enforcing these constraints.

Application Identifiers, referring to one or more Packet Flow Descriptions (PFDs), may be used as alternative traffic filtering parameters for dynamic policy invocation. The Media AF shall first provision a PFD in the NEF's PFD Function (PFDF) for one or more (external) Application IDs by sending an HTTP POST message to the NEF as specified in clause 4.4.10 of TS 29.122 [29122]. The mapping between the (external) Application Identifiers and PFDs stored in the PFDF will then be pushed to or pulled from the SMF and installed in the UPF for future traffic identification.

The Dynamic Policy Instance resource created as a result of instantiating a Policy Template shall include an MQTT endpoint address that allows the Media Session Handler to subscribe to receive asynchronous notifications from the Media AF concerning Background Data Transfer opportunities available in relation to that Dynamic Policy Instance.

HTTP responses for successful and operation-specific failure cases are specified in the following clauses. For all other failure cases, an HTTP response indicating a response code in accordance with clause 7.1.6 shall be returned to the API client. In all failure cases a message body in accordance with clause 7.1.7 shall be included in the response message.

#### 5.3.3.2 Create Dynamic Policy Instance resource operation

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3. For each application flow to be managed by the Dynamic Policy Instance resource, an instance of the Application‌Flow‌Binding object shall be present in the appplication‌Flow‌Bindings array. The applicationFlow‌Specification property of this object shall be populated by the Media Session Handler and shall declare a Service Data Flow template according to TS 23.503 [23503] that describes the application flow in question. Exactly one of the following filtering specifications shall be populated in the Application‌FlowDescription object to identify traffic belonging to a media delivery application flow:

- a packetFilter object (including 5-tuples, Type of Service, Security Parameter Index, etc.).

- a domainName populated with a fully-qualified Internet domain name.

 In addition, the top-level media type of the application flow may be declared in the mediaType property.

 A Media Client shall not attempt to instantiate more than one Dynamic Policy Instance at the same time that cites the same domainName and mediaType values. In the absence of mediaType, the domainName alone (if present) shall be unique for all current Dynamic Policy Instances belonging to each Media Client.

 When the policy binding for the chosen Policy Template indicates that PDU Set marking is enabled (i.e., the pduSetMarking flag is set to true in Service Access Information), the Media Session Handler shall also populate the mediaTransportParameters property with the media transport protocol parameters to be used by the Media Access Function on the application flow in question to label PDUs belonging to the same PDU Set and/or to indicate the last PDU in each PDU Set and/or to indicate the end of a data burst comprising one or more PDU Sets.

4. When the Media Session Handler attempts to activate a QoS-related Policy Template, the qosSpecification property shall also be present in the Application‌Flow‌Binding object containing the following properties specified in clause 7.3.3.6 to describe the QoS requirements of the media application flows described by the bound applicationFlowSpecification property:

- downlinkBitRates shall indicate the maximum requested bit rate, minimum desired bit rate and minimum requested bit rate in the downlink direction.

- uplinkBitRates shall indicate the maximum requested bit rate, minimum desired bit rate and minimum requested bit rate in the uplink direction.

- desiredPacketLatency may indicate the desired packet latency in both the downlink and uplink directions.

- desiredPacketLossRate may indicate the desired packet loss rate in both the downlink and uplink directions.

- desiredDownlinkPduSetQosParameters may be populated to indicate the desired delay budget and error rate for PDU Sets in the downlink direction, as well as indicating whether the loss of a single PDU in a PDU Set is significant for the receiving application.

- desiredUplinkPduSetQosParameters may be populated to indicate the desired delay budget and error rate for PDU Sets in the uplink direction, as well as indicating whether the loss of a single PDU in a PDU Set is significant for the receiving application.

5. When the Media Session Handler instantiates a Policy Template that is provisioned with a Background Data Transfer (BDT) specification per clause 5.2.7.1, the bdtSpecification property shall be present and it shall contain the following properties:

- estimatedDataTransferVolume, indicating the data volume that the Media Client estimates it will use during the current Background Data Transfer time window.

- The windows property indicates time windows over which Background Data Transfers are offered to the Media Session Handler.

- The maximimumDownlinkBitRate and maximimumUplinkBitRate properties indicate the maximum bit rate for Background Data Transfers in the downlink and uplink directions respectively that the Media Session Handler is bidding for. In response, the Media AF populates these properties with the maximum permitted bit rate for Background Data Transfers in the downlink and uplink directions respectively when the dynamic policy is in force.

6. When the 5G System employs a traffic enforcement function to ensure that traffic complies with the policy described by the qosSpecification property, the Media AF shall explicitly indicate this in the Dynamic Policy resource representation by setting the qosEnforcement property to true.

If the operation is successful, the Media AF shall create a new Dynamic Policy Instance resource. In this case, the Media AF shall return a 201 (Created) HTTP response message to the Media Session Handler, and the URL of the newly created Dynamic Policy Instance resource, including its resource identifier, shall be provided as the value of the Location HTTP header field. The response message body shall be a representation of the current state of the Dynamic Policy Instance resource (see clause 9.3.3.1), including any properties assigned by the Media AF.

When the Dynamic Policy Instance is successfully instantiated, the Media AF triggers the creation of a corresponding PCC rule in the 5G System according to clause 5.5.3 to enforce the required QoS and/or charging policy on the specified application flow(s). Depending on the ApplicationFlowDescription objects in the received Dynamic Policy Instance resource representation and the filterMethod indicated by each one, the Media AF shall populate for each one a flowDescription object and/or provide an Application Identifier referring to a PFD (Packet Flow Description) object containing the domain name of a Media AS instance.

NOTE: When the Media AF is deployed in an external Data Network, it is the responsibility of the NEF to map any external Application Identifier supplied by the Media AF into an internal Application Identifier that is known to the PCF.

If the supplied Dynamic Policy Instance is not acceptable to the Media AF, the create operation shall fail with an HTTP response status code of 400 (Bad Request) and an error message body per clause 7.1.7. In this case, the Dynamic Policy Instance resource shall remain in an uncreated state in the Media AF.

If the request is acceptable but the Media AF forbids the instantiation of the referenced Policy Template, for example because the quota for Background Data Transfers has been exceeded or because the UE is not permitted in the charging specification, the create operation shall fail with an HTTP response status code of 403 (Forbidden) and an error message body per clause 7.1.7. In this case, the Dynamic Policy Instance resource shall remain in an uncreated state in the Media AF.

If the request is acceptable but the Media AF is unable to provision the resources required by the supplied Dynamic Policy Instance, the create operation shall fail with an HTTP response status code of 500 (Internal Server Error) and an error message body per clause 7.1.7. In this case, the Dynamic Policy Instance resource shall remain in an uncreated state in the Media AF.

If the Media Session Handler needs to instantiate several dynamic policies, it may invoke this operation as often as needed.

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#### 5.3.4.2 Create Network Assistance Session resource operation

This operation is used by the Media Session Handler to create a Network Assistance Session in the Media AF. The POST HTTP method shall be used for this purpose and the request message body shall be a Network Assistance Session resource representation as specified in clause 9.4.3.1.

1. The provisioningSessionId property associates the Network Assistance Session with a Provisioning Session.

2. The slice property associates the Network Assistance Session with a specific network slice.

3. The dataNetworkName property associates the Network Assistance Session with a specific named Data Network.

4. The Media Session Handler shall populate the Network Assistance Session resource representation in the request with service data flow information and optionally the Policy Template identifier of the network QoS policy currently in force on the media streaming session for which Network Assistance operations are to be performed. (The Media AF subsequently uses this information to execute Network Assistance operations in the 5GC.)

 The applicationFlowDescription property of the Network Assistance Session resource representation shall be populated by the Media Session Handler and shall declare a Service Data Flow template according to TS 23.503 [33] that describes the application data flow for which network assistance is sought. Exactly one of the following filtering specifications shall be populated in the Application‌FlowDescription object to identify traffic belonging to a media delivery application flow:

- a packetFilter object (including 5-tuples, Type of Service, Security Parameter Index, etc.).

- a domainName.

 In addition, the top-level media type of the application flow may be declared in the mediaType property.

 A Media Client shall not attempt to instantiate more than one Network Assistance Session at the same time that cites the same domainName and mediaType values. In the absence of mediaType, the domainName alone (if present) shall be unique for all current Network Assistance Sessions belonging to each Media Client.

 When the policy binding for the Policy Template indicated by policyTemplateId (if present) indicates that PDU Set marking is enabled (i.e., the pduSetMarking flag is set to true in Service Access Information), the Media Session Handler shall also populate the mediaTransportParameters property with the media transport protocol parameters to be used by the Media Access Function on the application flow in question to label PDUs belonging to the same PDU Set and/or to indicate the last PDU in each PDU Set and/or to indicate the end of a data burst comprising one or more PDU Sets.

5. The requestedQoS property may be provided in the Network Assistance Session resource representation to specify an initial network QoS the Media Session Handler wishes to use for the media streaming session. If the policyTemplateId property is also populated in the Network Assistance Session resource representation, the Media AF shall return a 400 (Bad Request) HTTP response message if the requested network QoS lies outside the limits specified in the referenced Policy Template.

- If the requestedQoS property is omitted from the Network Assistance Session resource representation but the policyTemplateId is populated, the Media AF shall use the network QoS currently provisioned in the referenced Policy Template as the floor/ceiling for bit rate recommendations and delivery boosts within the scope of the Network Assistance Session.

- If neither a policyTemplateId nor a requestedQoS are supplied when creating a Network Assistance Session, operations invoked on the Media AF within the scope of the Network Assistance session are constrained only by the policies of the PCF. Upon successful creation, the Media AF shall return a 201 (Created) response message and the URL of the newly created resource, including its Network Assistance session resource identifier, shall be provided as the value of the Location HTTP header field. The response message body shall be a representation of the current state of the Network Assistance Session resource (see clause 9.4.3.1), including any properties assigned by the Media AF.

If the operation is successful, the Media AF shall create a new Network Assistance Session resource. In this case, the Media AF shall return a 201 (Created) HTTP response message to the Media Session Handler, and the URL of the newly created Network Assistance Session resource, including its resource identifier, shall be provided as the value of the Location HTTP header field. The response message body shall be a representation of the current state of the Network Assistance Session resource (see clause 9.4.3.1), including any properties assigned by the Media AF.

When the Network Assistance Session is successfully instantiated, the Media AF triggers the creation of a corresponding PCC rule in the 5G System according to clause 5.5.4 to enforce the required QoS on the specified application flow(s). Depending on the ApplicationFlowDescripton objects in the received Network Assistance Session resource representation and the filterMethod indicated by each one, the Media AF shall populate for each one a flowDescription object and/or provide an Application Identifier referring to a PFD (Packet Flow Description) object containing the domain name of a Media AS instance.

NOTE: When the Media AF is deployed in an external Data Network, it is the responsibility of the NEF to map any external Application Identifier supplied by the Media AF into an internal Application Identifier that is known to the PCF.

If the supplied Network Assistance Session is not acceptable to the Media AF, the create operation shall fail with an HTTP response status code of 400 (Bad Request) and an error message body per clause 7.1.7. In this case, the Network Assistance Session resource shall remain in an uncreated state in the Media AF.

If the request is acceptable but the Media AF forbids the use of the referenced Policy Template in a Network Assistance Session, for example because the UE is not permitted in the charging specification, the create operation shall fail with an HTTP response status code of 403 (Forbidden) and an error message body per clause 7.1.7. In this case, the Network Assistance Session resource shall remain in an uncreated state in the Media AF.

If the request is acceptable but the Media AF is unable to provision the resources required by the supplied Network Assistance Session, the create operation shall fail with an HTTP response status code of 500 (Internal Server Error) and an error message body per clause 7.1.7. In this case, the Network Assistance Session resource shall remain in an uncreated state in the Media AF.

The Media Client uses the Network Assistance Session resource identifier (naSessionId) provided by the Media AF to refer all subsequent API calls to the Media AF instance responsible for that Network Assistance Session.

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### 5.5.3 Policy control interactions for Dynamic Policies

The Dynamic Policies feature operates at reference point M5 between the Media Session Handler in the Media Client and a Media AF that has been appropriately provisioned with Policy Templates (see clause 5.2.7). The Dynamic Policy API at reference point M5 (see clauses 5.3.3 and 9.3) is specified in a generic way such that the associated functionality in the 5GC may be realised by various means.

NOTE 1: This clause does not limit the possible set of 5G System exposure functionalities for realising dynamic policies.

In this release, the Media AF converts Dynamic Policies API invocations received at reference point M5 into direct or indirect invocations of the Policy Authorization Service exposed by the PCF, and converts responses from the PCF into their equivalents at reference point M5 for return to the Media Session Handler.

To realise dynamic policies, the Media AF shall interact with the PCF using one of the following methods:

A. If the Media AF is deployed in the Trusted DN, it may directly invoke the Npcf\_Policy‌Authorization service at reference point N5, as specified in TS 29.514 [29514].

NOTE 2: It is the responsibility of the Media AF in this case to discover and track changes to the PCF instance responsible for the PDU Session supporting the media streaming session at reference point M4 using the discovery services provided by the NRF and/or BSF.

B. If the Media AF is deployed outside the Trusted DN, or if it is more convenient for a Media AF deployed in the Trusted DN to do so, it invokes the Nnef\_AFSession‌With‌QoS and/or Nnef\_Chargeable‌Party services exposed by the NEF, as specified in clauses 4.4.9 and 4.4.8 respectively of TS 29.522 [29522], to indirectly invoke the PCF at reference point N33.

NOTE 3: Per clause 4.4.9 of TS 29.522 [29522], the Nnef\_AFSession‌With‌QoS service is realised at reference point N33 by the AsSession‌With‌QoS exposure API. Similarly, the Nnef\_Chargeable‌Party service is realised by the Chargeable‌Party exposure API per clause 4.4.8 of [29522].

NOTE 4: Configuration of the NEF endpoint address and access credentials in the Media AF in this case is beyond the scope of the present document.

When the first Dynamic Policy is created by the Media Session Handler for a particular media delivery session (per clause 5.3.3.2), the Media AF shall create an *AF application session context* in the PCF responsible for the PDU Session corresponding to the M4 application flows indicated in the DynamicPolicy.‌application‌Flow‌Bindings array.

If no corresponding AF application session context already exists, the Media AF shall use the Npcf\_‌Policy‌Authorization\_‌Create operation at reference point N5 (or, if deployed outside the Trusted DN, the equivalent AsSession‌WithQoS service operation) with the appropriate service information to create and provision a new AF application session context. The information in the AppSessionContext‌ReqData shall be derived from the application flow descriptions in the Dynamic Policy Instance resource and/or the requested QoS.

The AF application session context shall declare exactly one MediaComponent child object per Dynamic Policy Instance. A separate sub-component shall be declared for each M4 application flow listed in the DynamicPolicy.‌application‌Flow‌Bindings array.

If the pduSetQoSLimits property is populated in M1QoSSpecification.‌downlink‌QoS‌Specification, then the Media‌Component.‌pduSetQosDl object shall be populated as follows by the Media AF:

- The pduSetDelayBudget property shall be set to the larger value of pduSetQoSLimits.‌pduSetDelayBudget and desiredDownlink‌PduSet‌QosParameters.‌pduSetDelayBudget.

- The pduSetErrorRate property shall be set to the larger value of pduSetQoSLimits.pduSetErrorRate and desiredDownlink‌PduSet‌QosParameters.‌pduSetErrorRate.

- The pduSetHandlingInfo property shall be set to the value of pduSetQoSLimits.pduSetHandlingInfo, ignoring the value of desiredDownlink‌PduSet‌QosParameters.‌pduSetHandlingInfo, if any.

Otherwise, the Media‌Component.‌pduSetQosDl object shall be populated directly from the desiredDownlink‌PduSet‌QosParametersobject.

If the pduSetQoSLimits property is populated in M1QoSSpecification.‌uplink‌QoS‌Specification, then the Media‌Component.‌pduSetQosUl object shall be populated as follows by the Media AF:

- The pduSetDelayBudget property shall be set to the larger value of pduSetQoSLimits.‌pduSetDelayBudget and desiredUplink‌PduSet‌QosParameters.‌pduSetDelayBudget.

- The pduSetErrorRate property shall be set to the larger value of pduSetQoSLimits.‌pduSetErrorRate and desiredUplink‌PduSet‌QosParameters.‌pduSetErrorRate.

- The pduSetHandlingInfo property shall be set to the value of pduSetQoSLimits.‌pduSetHandlingInfo, ignoring the value of desiredUplink‌PduSet‌QosParameters.‌pduSetHandlingInfo, if any.

Otherwise, the Media‌Component.‌pduSetQosUl object shall be populated directly from the desiredUplink‌PduSet‌QosParametersobject.

For each of the Dynamic Policy Instances it is managing, the Media AF shall subscribe to the following PCF notifications on the corresponding AF application session context:

- Service Data Flow QoS notification control;

- Service Data Flow deactivation;

- Resources allocation outcome.

When requesting QoS provisioning for a media delivery session, the Media AF shall use the configured Policy Template of the Dynamic Policy Instance to determine the list of the QoS references within altSerReqs. The lowest priority index shall be assigned to the Policy Template with the lowest QoS requirement, and the highest priority shall be assigned to the Service Operation Point requested by the UE (if the UE is allowed to use that operation point).

When instantiating a Policy Template that has a Background Data Transfer policy, the Media AF needs to populate some of the properties in the M5BDTSpecification object specified in clause 9.3.3.2 for inclusion in the Dynamic Policy Instance resource returned to the Media Session Handler at reference point M5.

Where the Policy Template references an existing Background Data Transfer policy by including the bdtPolicyId property, in order to populate the properties of the M5BDTSpecification object the Media AF shall first retrieve the individual Background Data Transfer policy resource referenced by bdtPolicyId from the PCF. The Npcf\_‌BDT‌Policy‌Control service operation specified in clause 5.3.3.3.1 of TS 29.554 [29554] shall be used for this purpose.

When a dynamic policy is subsequently destroyed by the Media Session Handler (per clause 4.7.3), the Media AF shall destroy the corresponding AF application session context in the relevant PCF instance.

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### 5.5.4 Policy control interactions for AF-based Network Assistance

The AF-based Network Assistance feature operates at reference point M5 between the Media Session Handler in the Media Client and a Media AF that provides Network Assistance capabilities. The Network Assistance API at reference point M5 (see clauses 5.3.4 and 9.4) is specified in a generic way such that the associated Network Assistance functionality in the 5GC may be realised by various means.

NOTE 1: This clause does not limit the possible set of 5G System exposure functionalities for obtaining Network Assistance information.

In this release, the Media AF converts Network Assistance API invocations received at reference point M5 into direct or indirect invocations of the Policy Authorization Service exposed by the PCF, and converts responses and notifications from the PCF into their equivalents at reference point M5 for delivery to the Media Session Handler.

If it supports the Network Assistance feature, the Media AF shall offer the bit rate recommendation (throughput estimation) and delivery boost request API based on existing Policy Templates that match the filtering criteria for a media streaming session, and the Media AF shall interact with the PCF using one of the following methods:

A. If the Media AF is deployed in the Trusted DN, it may directly invoke the Npcf\_Policy‌Authorization service at reference point N5, as specified in TS 29.514 [29514].

NOTE 2: It is the responsibility of the Media AF in this case to discover and track changes to the PCF instance responsible for the PDU Session supporting the media streaming session at reference point M4 using the discovery services provided by the NRF and/or BSF.

B. If the Media AF is deployed outside the Trusted DN, or if it is more convenient for a Media AF deployed in the Trusted DN to do so, it invokes the Nnef\_AFSessionWithQoS service exposed by the NEF, as specified in clause 4.4.9 of TS 29.522 [29522], to indirectly invoke the PCF at reference point N33.

NOTE 3: Per clause 4.4.9 of TS 29.522 [29522], the Nnef\_AFSession‌With‌QoS service is realised at reference point N33 by the AsSession‌With‌QoS exposure API.

NOTE 4: Configuration of the NEF endpoint address and access credentials in the Media AF in this case is beyond the scope of the present document.

When the first Network Assistance Session is created by the Media Session Handler for a particular media delivery session (per clause 5.3.4.2), the Media AF shall create an *AF application session context* in the PCF responsible for the PDU Session corresponding to the M4 application flow indicated in the NetworkAssistanceSession.‌applicationFlow‌Description property.

If no corresponding AF application session context already exists, the 5GMS AF shall use the Npcf\_‌Policy‌Authorization\_‌Create operation at reference point N5 (or, if deployed outside the Trusted DN, the equivalent AsSession‌WithQoS service operation) with the appropriate service information to create and provision a new AF application session context. The information in the AppSessionContext‌ReqData shall be derived from the application flow description in the Network Assistance session resource, as well as from the referenced Policy Template (if any) and/or the requested QoS.

The AF application session context shall declare exactly one MediaComponent child object per Network Assistance Session.

If the pduSetQoSLimits property is populated in M1QoSSpecification.‌downlink‌QoS‌Specification, then the Media‌Component.‌pduSetQosDl object shall be populated as follows by the Media AF:

- The pduSetDelayBudget property shall be set to the larger value of pduSetQoSLimits.‌pduSetDelayBudget and desiredDownlink‌PduSet‌QosParameters.‌pduSetDelayBudget.

- The pduSetErrorRate property shall be set to the larger value of pduSetQoSLimits.pduSetErrorRate and desiredDownlink‌PduSet‌QosParameters.‌pduSetErrorRate.

- The pduSetHandlingInfo property shall be set to the value of pduSetQoSLimits.pduSetHandlingInfo, ignoring the value of desiredDownlink‌PduSet‌QosParameters.‌pduSetHandlingInfo, if any.

Otherwise, the Media‌Component.‌pduSetQosDl object shall be populated directly from the desiredDownlink‌PduSet‌QosParametersobject.

If the pduSetQoSLimits property is populated in M1QoSSpecification.‌uplink‌QoS‌Specification, then the Media‌Component.‌pduSetQosUl object shall be populated as follows by the Media AF:

- The pduSetDelayBudget property shall be set to the larger value of pduSetQoSLimits.‌pduSetDelayBudget and desiredUplink‌PduSet‌QosParameters.‌pduSetDelayBudget.

- The pduSetErrorRate property shall be set to the larger value of pduSetQoSLimits.‌pduSetErrorRate and desiredUplink‌PduSet‌QosParameters.‌pduSetErrorRate.

- The pduSetHandlingInfo property shall be set to the value of pduSetQoSLimits.‌pduSetHandlingInfo, ignoring the value of desiredUplink‌PduSet‌QosParameters.‌pduSetHandlingInfo, if any.

Otherwise, the Media‌Component.‌pduSetQosUl object shall be populated directly from the desiredUplink‌PduSet‌QosParametersobject.

For each of the Network Assistance Sessions it is managing, the 5GMS AF shall subscribe to the following PCF notifications on the corresponding AF application session context:

- Service Data Flow QoS notification control;

- Service Data Flow deactivation;

- Resources allocation outcome.

When requesting QoS provisioning for a Network Assistance Session, the Media AF shall use the configured Policy Templates of the Provisioning Session to determine the list of the QoS references within altSerReqs. The lowest priority index shall be assigned to the Policy Template with the lowest QoS requirement, and the highest priority shall be assigned to the Service Operation Point requested by the UE (if the UE is allowed to use that operation point).

When a Network Assistance session is subsequently destroyed by the Media Session Handler (per clauses 5.3.4.7 and 11.6.4.6), the Media AF shall destroy the corresponding AF application session context in the relevant PCF instance.

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### 7.3.3 Structured data types

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#### 7.3.3.2 ApplicationFlowDescription type

Table 7.3.3.2-1: Definition of type ApplicationFlowDescription

|  |  |  |  |
| --- | --- | --- | --- |
| Property name | Data type | Cardinality | Description |
| filterMethod | SdfMethod | 1..1 | The filtering method used to identify packets belonging to this application flow (see clause 7.3.4.2). |
| packetFilter | IpPacketFilterSet | 0..1 | Description of the application flow in terms of packet header field values (see below). |
| domainName | string | 0..1 | Description of the application flow in terms of the Fully-Qualified Domain Name (FQDN) of the Media AS targeted at reference point M4 (see NOTE 2 and below). |
| mediaType | MediaType | 0..1 | The type of media carried by this application flow. |
| mediaTransport‌Parameters | Protocol‌Description | 0..1 | The set of media transport protocol parameters to be used by the 5G Core for the purpose of PDU Set identification and/or end of data burst detection on this application flow (see NOTE 3). |
| NOTE 2: Enumeration MediaType is specified in clause 5.6.3.3 of TS 29.514 [29514].NOTE 3 Data type ProtocolDescription is specified in clause 5.5.4.13 of TS 29.571 [29571]. |

Exactly one of the following properties shall be populated: flowDescription, domainName.

#### 7.3.3.3 M1UnidirectionalQoSSpecification type

Table 7.3.3.3-1: Definition of type M1UnidirectionalQoSSpecification

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Property name | Data type | Cardinality | Usage | Description |
| maximumBitRate | BitRate | 1..1 | RO | Maximum bit rate supported by the 5G System.Populated by the Media AF. |
| maximumAuthorisedBitRate | BitRate | 0..1 | RW | Maximum bit rate authorised by the Media Application Provider. |
| minimumPacketLossRate | Packet‌Loss‌Rate | 0..1 | RW | Minimum packet loss rate permitted by the Media Application Provider, expressed in tenth of a percent. |
| pduSetQosLimits | PDUSet‌Qos‌Para | 0..1 | RW | QoS limits for PDU Sets, including minimum delay budget and minimum error rate permitted by the Media Application Provider, and an indication by the Media Application Provider of whether the receiving application is sensitive to the loss of individual PDUs in a PDU Set (see NOTE). |
| NOTE: Data type PDUSetQosPara is specified in clause 5.5.4.11 of TS 29.571 [29571]. |

#### 7.3.3.4 M1QoSSpecification type

Table 7.3.3.4-1: Definition of type M1QoSSpecification

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Property name | Data type | Cardinality | Usage | Description |
| qosReference | string | 0..1 |  | As specified in clause 5.6.2.7 of TS 29.514 [29514]. |
| downlink‌Qos‌Specification | M1Unidirectional‌QoS‌Specification | 0..1 |  | QoS specification in the downlink direction (see below and clause 7.3.3.3). |
| uplink‌Qos‌Specification | M1Unidirectional‌QoS‌Specification | 0..1 |  | QoS specification in the uplink direction (see below and clause 7.3.3.3). |
| pdu‌Set‌Marking | boolean | 0..1 |  | Indicates that packets contributed to the Media AS are required to include PDU Set marking if the media transport protocol supports this.Default value false if omitted. |

At least one of the following properties shall be populated: qosReference, downlink‌Qos‌Specification, uplink‌Qos‌Specification.

#### 7.3.3.5 M5BitRateSpecification type

Table 7.3.3.5-1: Definition of type M5BitRateSpecification

|  |  |  |  |
| --- | --- | --- | --- |
| Property name | Data type | Cardinality | Description |
| maximumRequestedBitRate | BitRate | 1..1 | Maximum requested bit rate. |
| minimumDesiredBitRate | BitRate | 0..1 | Minimum desired bit rate. |
| minimumRequestedBitRate | BitRate | 1..1 | Minimum requested bit rate. |

#### 7.3.3.6 M5QoSSpecification type

Table 7.3.3.6-1: Definition of type M5QoSSpecification

|  |  |  |  |
| --- | --- | --- | --- |
| Property name | Data type | Cardinality | Description |
| downlinkBitRates | M5BitRate‌Specification | 1..1 | Bit rate specification for the downlink direction (see clause 7.3.3.5). |
| uplinkBitRates | M5BitRate‌Specification | 1..1 | Bit rate specification for the uplink direction (see clause 7.3.3.5). |
| desiredPacketLatency | number | 0..1 | Desired packet latency in milliseconds, expressed as a positive floating-point value (see NOTE 1). |
| desiredPacketLossRate | Packet‌Loss‌Rate | 0..1 | Desired packet loss rate expressed in tenth of a percent (see NOTE 1). |
| desiredDownlinkPduSetQosParameters | PDUSet‌Qos‌Para | 0..1 | Desired PDU Set QoS parameters for the downlink direction (see NOTE 2). |
| desiredUplinkPduSetQosParameters | PDUSet‌Qos‌Para | 0..1 | Desired PDU Set QoS parameters for the uplink direction (see NOTE 2). |
| NOTE 1: Clause 5.6.2.7 of TS 29.514 [29514] restricts packet latency and packet loss to be the same in the downlink and uplink directions for a given MediaComponent when the CHEM feature is not supported by the PCF.NOTE 2: Data type PDUSetQosPara is specified in clause 5.5.4.11 of TS 29.571 [29571]. |

(Snip)

#### 7.3.3.10 EdgeProcessingEligibilityCriteria type

Table 7.3.3.10-1: Definition of EdgeProcessingEligibilityCriteria type

| Property name | Type | Cardinality | Description |
| --- | --- | --- | --- |
| application‌Flow‌Descriptions | array(Application‌Flow‌Description) | 1..1 | A set of application flow descriptions that are to be used as triggers for invoking edge media processing (see NOTE 1).If the set is empty, edge media processing may be invoked for an otherwise eligible media stream session on any service data flow.Valid ApplicationFlowDescription elements:- domainName- packetFilter.destinationAddress and packetFilter.destinationPort- packetFilter.differentiatedServices- packetFilter.flowLabelOther ApplicationFlowDescription settings shall be rejected by the Media AF. |
| ueLocations | array(Location‌Area5G) | 1..1 | A set of geographical areas in which edge media processing is to be triggered when a UE is present (see NOTE 2).If the set is empty, edge media processing may be invoked for an otherwise eligible media stream session in any location. |
| timeWindows | array(TimeWindow) | 1..1 | Edge media processing is triggered when the media streaming session is taking place during one of the indicated time windows (see NOTE 2).If the set is empty, edge media processing may be invoked for an otherwise eligible media stream session at any time. |
| appRequest | boolean | 1..1 | When set true, edge media processing is to be triggered based on application request only. |
| NOTE 1: The usage of these fields to influence route selection and EAS reselection are for future study.NOTE 2: Data types LocationArea5G and TimeWindow are defined in TS 24.558 [24558]. |

#### 7.3.3.11 EndpointAddress type

Table 7.3.3.11-1: Definition of EndpointAddress type

| Property name | Type | Cardinality | Description |
| --- | --- | --- | --- |
| domainName | string | 0..1 | Internet domain name of the endpoint(s). |
| ipv4Addr | Ipv4Addr | 0..1 | Ipv4 address of the endpoint(s). |
| ipv6Addr | Ipv6Addr | 0..1 | Ipv6 address of the endpoint(s). |
| portNumbers | array(Uint16) | 1..1 | Port number of each endpoint.The array shall contain at least one member. |

Either the domainName property, or at least one of ipv4Addr or ipv6Addr shall be present.

(Snip)

#### 7.3.3.15 ApplicationFlowBinding

Table 7.3.3.15: ApplicationFlowBinding type

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Property name | Data type | Cardinality | Usage | Description |
| application‌Flow‌Specification | Application‌Flow‌Description | 1..1 | C: RWR: ROU: RW | The specification of an application flow to be used by the 5G Core for application traffic identification purposes (see clause 7.3.3.2). |
| qos‌Specification | M5‌QoS‌Specification | 0..1 | C: RWR: ROU: RW | The network Quality of Service requirements of the application flow(s) described by application‌Flow‌Description. |

NEXT CHANGE

#### 7.3.4.3 ProvisioningSessionType enumeration

Table 7.3.4.3‑1: Definition of ProvisioningSessionType enumeration

|  |  |
| --- | --- |
| Enumeration value | Description |
| MS\_DOWNLINK | Downlink media streaming |
| MS\_UPLINK | Uplink media streaming |
| RTC | Real-time media communication (RTC) |

NEXT CHANGE

## 8.1 Overview

This clause defines the provisioning API used by a Media Application Provider at reference point M1 to configure downlink Media Delivery, uplink Media Delivery, or Real-time Communication services. The corresponding OpenAPI definitions for the Maf\_Provisioning service are specified in clause A.3. A summary of the resource structure is shown in table 8.1‑1 below. The default endpoint address of the Media AF at reference point M1 is specified in clause 7.1.2.1.

Table 8.1‑1: Resource structure of Maf\_Provisioning APIs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| HTTP request path element hierarchy | Description | Allowed HTTP methods | Resource | OpenAPI |
| Create | Retrieve | Update | Destroy | Non-RESTful operation | structure definition clause | definition clause |
| provisioning-sessions | Provisioning Sessions collection | POST | GET |  |  |  | 8.2.2 | A.3.1 |
|  {provisioningSessionId} | Provisioning Session resource |  | GET |  | DELETE |  |
|  content-protocols | Content Protocols resource |  | GET |  |  |  | 8.3.2 | A.3.2 |
|  certificates | Server Certificates collection | POST |  |  |  |  | 8.4.2 | A.3.3 |
|  {certificateId} | Server Certificate resource |  | GET | PUT | DELETE |  |
|  content-preparation-templates | Content Preparation Templates collection | POST |  |  |  |  | 8.5.2 | A.3.4 |
|  {contentPreparationTemplateId} | Content Preparation Template resource |  | GET | PUT, PATCH | DELETE |  |
|  edge-resources-configurations | Edge Resources Configurations collection | POST |  |  |  |  | 8.6.2 | A.3.5 |
|  {edgeResourcesConfigurationId} | Edge Resources Configuration resource |  | GET | PUT, PATCH | DELETE |  |
|  policy-templates | Policy Templates collection | POST |  |  |  |  | 8.7.2 | A.3.6 |
|  {policyTemplateId} | Policy Template resource |  | GET | PUT, PATCH | DELETE |  |
|  content-hosting-configuration | Content Hosting Configuration resource | POST | GET | PUT, PATCH | DELETE |  | 8.8.2 | A.3.7 |
|  purge | Content Hosting cache purge operation |  |  |  |  | POST |
|  content-publishing-configuration | Content Publishing Configuration resource | POST | GET | PUT, PATCH | DELETE |  | 8.9.2 | A.3.8 |
|  purge | Content Publishing cache purge operation |  |  |  |  | POST |
|  rtc-configuration | RTC Configuration resource | POST | GET | PUT, PATCH | DELETE |  | 8.10.2 | A.3.9 |
|  metrics-reporting-configuration | Metrics Reporting Configuration collection | POST |  |  |  |  | 8.11.2 | A.3.10 |
|  {metricsReportingConfigurationId} | Metrics Reporting Configuration resource |  | GET | PUT, PATCH | DELETE |  |
|  consumption-reporting-configuration | Consumption Reporting Configuration resource | POST | GET | PUT, PATCH | DELETE |  | 8.12.2 | A.3.11 |
|  event-data-processing-configurations | Event Data Processing Configuration collection | POST |  |  |  |  | 8.13.2 | A.3.12 |
|  {event‌Data‌Processing‌ConfigurationId} | Event Data Processing Configuration resource |  | GET | PUT, PATCH | DELETE |  |

NEXT CHANGE

#### 8.2.3.1 ProvisioningSession resource

Different properties are present in the ProvisioningSession resource depending on the type of Provisioning Session indicated in the provisioningSessionType property, and this is specified in the *Applicability* column.

Table 8.2.3.1‑1: Definition of ProvisioningSession resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Property name | Type | Cardinality | Usage | Description | Applicability |
| provisioningSessionId | ResourceId | 1..1 | C: ROR: ROU: – | A unique identifier for this Provisioning Session. | All types. |
| provisioningSession‌Type | Provisioning‌Session‌Type | 1..1 | C: RWR: RWU: – | The type of Provisioning Session. | All types. |
| aspId | AspId | 0..1 | C: RWR: RWU: – | The identity of the Application Service Provider responsible for this Provisioning Session, as specified in clause 5.6.2.3 of TS 29.514 [29514]. | All types. |
| appId | ApplicationId | 1..1 | C: RWR: RWU: – | The Application Identifier (see table 5.4.2‑1 of TS 29.571 [29571]) to which this Provisioning Session pertains.The same <aspId, ‌appId> duple may be present in several Provisioning Sessions in a given 5GMS System.Used as the AF Application identifier (see clause 5.6.2.3 of TS 29.514 [29514]) for PCF interactions. When a 5GMS AF in the Trusted DN is provisioned from outside the Trusted DN, the NEF is responsible for mapping an external Application Identifier to the corresponding internal AF Application Identifier known to the PCF. | All types. |
| locationReporting | boolean | 0..1 |  | If true, the Media Session Handler is required to populate UE location information in Dynamic Policy interactions (see clause 9.3.3.1), Network Assistance interactions (see clause 9.4.3.1), QoE metrics reporting interactions (see clause 9.5.3) and consumption reporting interactions (see clause 9.6.3.2) with a Media AF deployed by an MNO or trusted third party.If false or omitted, UE location shall not be populated by the Media Session Handler in any of the abovementioned interactions. |  |
| serverCertificateIds | array(ResourceId) | 0..1 | C: ROR: ROU: – | A list of Server Certificate identifiers currently associated with this Provisioning Session. | DOWNLINK,UPLINK,RTC |
| contentPreparation‌TemplateIds | array(ResourceId) | 0..1 | C: ROR: ROU: – | A list of Content Preparation Template identifiers currently associated with this Provisioning Session. | DOWNLINK,UPLINK |
| metricsReporting‌ConfigurationIds | array(ResourceId) | 0..1 | C: ROR: ROU: – | A list of Metrics Reporting Configuration identifiers currently associated with this Provisioning Session. | DOWNLINK,UPLINK,RTC |
| policyTemplateIds | array(ResourceId) | 0..1 | C: ROR: ROU: – | A list of Policy Template identifiers currently associated with this Provisioning Session. | DOWNLINK,UPLINK,RTC |
| edgeResources‌ConfigurationIds | array(ResourceId) | 0..1 | C: ROR: ROU: – | A list of Edge Resources Configuration identifiers currently associated with this Provisioning Session. | DOWNLINK,UPLINK,RTC |
| eventDataProcessing‌ConfigurationIds | array(ResourceId) | 0..1 | C: ROR: ROU: – | A list of Event Data Processing Configuration identifiers currently associated with this Provisioning Session. | DOWNLINK,UPLINK |

NEXT CHANGE

## 8.10 Real-time Media Communication provisioning API

### 8.10.1 Overview

The Real-time Media Communication provisioning API is used by the Media Application Provider to supply configuration information, in the form of an RTCConfiguration resource (specified in clause 8.10.3) that is used by the Media Client to gain access to real-time media communication (RTC) functionality of the Media AS. The provisioning API allows for the enablement and/or advertisement of ICE (STUN, TURN, and/or SWAP) services to support communication between Media Clients in an RTC-based media delivery session. These services may either be provided by the Media AS itself or provisioned by the Media AF.

### 8.10.2 Resource structure

The RTC Configuration API is accessible through this URL base path:

{apiRoot}/3gpp-maf-provisioning/{apiVersion}/provisioning-sessions/{provisioningSessionId}/

Table 8.10.2-1 below specifies the operations and the corresponding HTTP methods that are supported by this API. In each case, the Provisioning Session identifier shall be substituted into {provisioningSessionId} in the above URL template and the sub-resource path specified in the second column shall be appended to the URL base path.

Table 8.10.2‑1: Operations supported by the Real-Time Communication Configuration API

|  |  |  |  |
| --- | --- | --- | --- |
| Operation name | Sub‑resource path | Allowed HTTP method(s) | Description |
| Create RTC Configuration | rtc-configuration | POST | Create the RTC Configuration resource within the context of a parent Provisioning Session. |
| Retrieve RTC Configuration | GET | Retrieve an existing RTC Configuration resource. |
| Update RTC Configuration | PUT, PATCH | Modify an existing RTC Configuration resource. |
| Destroy RTC Configuration | DELETE | Destroy an existing RTC Configuration resource. |

### 8.10.3 Data model

#### 8.10.3.1 RTCConfiguration resource

Table 8.10.3.1-1: Definition of RTCConfiguration resource

| Property name | Data Type | Cardinality | Description |
| --- | --- | --- | --- |
| edgeResources‌ConfigurationId | ResourceId | 0..1 | A reference to an Edge Resources Configuration resource (see clause 8.6.2).When present, indicates that the Media AS supporting this RTC Configuration shall be realised as a set of one or more EAS instances configured per the referenced resource. |
| enableStunService | boolean | 0..1 | If true, the Media AS shall provide a STUN service to the Media Session Handler for use in RTC-based media delivery sessions initiated in the context of the parent Provisioning Session.If false the Media Application Provider may populate the stunEndpoints property.If omitted, the default value shall be false and the . |
| stunEndpoints | array(EndpointAccess) | 0..1 | A list of trusted STUN server endpoints populated by the Media Application Provider or else by the Media AF that may be used as ICE candidates for RTC-based media delivery sessions.If present, the array shall contain at least one member. |
| enableTurnService | boolean | 0..1 | If true, the Media AS shall provide a TURN service to the Media Session Handler for use in RTC-based media delivery sessions initiated in the context of the parent Provisioning Session.If false the Media Application Provider may populate the turnEndpoints property.If omitted, the default value shall be false. |
| turnEndpoints | array(EndpointAccess) | 0..1 | A list of trusted TURN server endpoints populated by the Media Application Provider or else by the Media AF that may be used as ICE candidates for RTC-based media delivery sessions.If present, the array shall contain at least one member. |
| enableSwapService | boolean | 0..1 | If true, the Media AS shall provide a SWAP service to the Media Session Handler for use in RTC-based media delivery sessions initiated in the context of the parent Provisioning Session.If false the Media Application Provider may populate the swapEndpoints property.If omitted, the default value shall be false. |
| swapEndpoints | array(EndpointAccess) | 0..1 | A list of trusted WebRTC Signalling Server endpoints populated by the Media Application Provider or else by the Media AF that support the SWAP protocol that may be used by the application for RTC-based media delivery sessions in the context of the parent Provisioning Session.If present, the array shall contain at least one member. |

#### 8.10.3.2 EndpointAccess

This data type is derived by extension from EndpointAddress (see clause 7.3.3.11).

Table 8.10.3.2-1: Definition of EndpointAccess resource

| Property name | Data Type | Cardinality | Description |
| --- | --- | --- | --- |
| domainName | string | 0..1 | The Fully-Qualified Domain Name of the service endpoint. |
| ipv4Address | Ipv4Addr | 0..1 | The IPv4 address of the service endpoint. |
| Ipv6Address | Ipv6Addr | 0..1 | The IPv6 address of the service endpoint. |
| portNumbers | array(Uint16) | 0..1 | A list of listening ports over which the service is accessible (e.g. STUN servers must offer two listening ports). |
| credentials | object | 0..1 | An object that provides authentication information to be used with the server. |
|  | username | string | 1..1 | A username that is authorized to access the server. |
|  | passphrase | string | 1..1 | The credentials that are associated with the username. |
| certificateId | ResourceId | 0..1 | An identifier of the certificate resource that provides the X.509 [X509] to be presented to Media Clients by the Media AS.Omitted when exposed at reference point M5. |

NEXT CHANGE

#### 9.2.3.1 ServiceAccessInformation resource type

The data model for the ServiceAccessInformation resource is specified in table 9.2.3.1-1 below. Different properties are present in the resource depending on the type of Provisioning Session from which the Service Access Information is derived (as indicated in the provisioningSessionType property) and this is specified in the *Applicability* column.

Table 9.2.3.1‑1: Definition of ServiceAccessInformation resource

| Property name | Type | Cardinality | Usage | Description | Applicability |
| --- | --- | --- | --- | --- | --- |
| provisioningSessionId | ResourceId | 1..1 | RO | Unique identification of the M1 Provisioning Session. | All types |
| provisioningSession‌Type | Provisioning‌Session‌Type | 1..1 | RO | The type of Provisioning Session. | All types. |
| locationReporting | boolean | 1..1 | RO | If true, the Media Session Handler is required to provide UE location data in Dynamic Policy interactions (see clause 9.3.3.1), Network Assistance interactions (see clause 9.4.3.1), QoE metrics reporting interactions (see clause 9.5.3) and consumption reporting interactions (see clause 9.6.3.2).Shall be set false if the locationReporting parameter is omitted from the ProvisioningSession, as specified in table 8.2.3.1‑1. |  |
| streamingAccess | object | 0..1 | RO | Present if Content Hosting or Content Publishing is provisioned in the parent Provisioning Session. | MS\_DOWNLINK |
|  | entryPoints | array(M5‌Media‌Entry‌Point) | 0..1 | RO | A list of alternative Media Entry Points for the Media Client to choose between. |
|  |  | locator | AbsoluteUrl | 1..1 | RO | A pointer to a document at reference point M2 that defines a media presentation e.g. MPD for DASH content or URL to a video clip file. |
|  |  | contentType | string | 1..1 | RO | The MIME content type of resource at locator.This property shall be mutually exclusive with *protocol*. |  |
|  |  | protocol | Uri | 1..1 | RO | A fully-qualified term identifier URI that identifies the media delivery protocol at reference point M4 for this Media Entry Point.This property shall be mutually exclusive with *contentType*.The controlled vocabulary of media delivery protocols at this reference point is specified in clause 10 of TS 26.512 [26512]. |  |
|  |  | profiles | array(Uri) | 0..1 | RO | An optional list of conformance profile URIs with which this Media Entry Point is compliant.If present, the array shall contain at least one item. |  |
|  | eMBMS‌Service‌Announcement‌Locator | AbsoluteUrl | 0..1 | RO | A pointer to an eMBMS User Service Announcement document. | MS\_DOWNLINK |
| rtcClientConfiguration | object | 0..1 | RO | Present if real-time media communication (RTC) is provisioned. | RTC |
|  | stunEndpoints | array(EndpointAccess) | 0..1 | RO | An array of trusted STUN service endpoints for use as ICE candidates.If the credentials property was not provisioned at reference point M1, the Media AF shall populate this with a set of credentials unique to the requesting Media Client. |
|  | turnEndpoints | array(EndpointAcess) | 0..1 | RO | An array of trusted TURN service endpoints for use as ICE candidates.If the credentials property was not provisioned at reference point M1, the Media AF shall populate this with a set of credentials unique to the requesting Media Client. |
|  | swapEndpoints | array(EndpointAccess) | 0..1 | RO | An array of trusted WebRTC Signalling Function service endpoints that support the SWAP protocol. If provided, the application shall use one of the listed servers for RTC-based media delivery sessions within the scope of provisioning‌SessionId.If the credentials property was not provisioned at reference point M1, the Media AF shall populate this with a set of credentials unique to the requesting Media Client. |
| clientConsumptionReporting‌Configuration | object | 0..1 | RO | Present if consumption reporting is activated for this Provisioning Session. | MS\_DOWNLINK,RTC |
|  |  | reportingInterval | DurationSec | 0..1 | RO | The time interval, expressed in seconds, between consumption report messages being sent by the Media Session Handler. The value shall be greater than zero.When this property is omitted, a single final report shall be sent immediately after the media streaming session has ended. |
|  |  | serverAddresses | array(AbsoluteUrl) | 1..1 | RO | A list of Media AF addresses (URLs) where the consumption reporting messages are sent by the Media Session Handler. See NOTE.Each address shall be an opaque base URL, following the format specified in clause 7.1.3 up to and including the {apiVersion} path element. |
|  |  | accessReporting | boolean | 1..1 | RO | Indicates whether the Media Session Handler is required to supply consumption reporting units whenever the access network changes during a media delivery session.Shall be set false if the accessReporting parameter is omitted from the Consumption‌Reporting‌Configuration, as specified in table 8.11.3.1‑1. |
|  |  | samplePercentage | Percentage | 1..1 | RO | The percentage of media delivery sessions that shall send consumption reports, expressed as a floating-point value between 0.0 and 100.0.Shall be set to 100.0 if the samplePercentage parameter is omitted from the Consumption‌Reporting‌Configuration, as specified in table 8.11.3.1‑1. |
| dynamicPolicyInvocation‌Configuration | object | 0..1 | RO | Present if Policy Templates have been provisioned in the parent Provisioning Session and at least one of them is in the READY state. | MS\_DOWNLINK,MS\_UPLINK,RTC |
|  | serverAddresses | array(AbsoluteUrl) | 1..1 | RO | A list of Media AF addresses (URLs) which offer the APIs for dynamic policy invocation sent by the Media Session Handler. See NOTE.Each address shall be an opaque base URL, following the format specified in clause 7.1.3 up to and including the {apiVersion} path element. |  |
|  | policyTemplateBindings | array(object) | 1..1 | RO | A list of duples, each one binding an external reference to a Policy Template resource identifier. |  |
|  |  | externalReference | string | 1..1 | RO | Additional identifier for this Policy Template, unique within the scope of its Provisioning Session, that can be cross-referenced with external metadata about the media streaming session.Example: "HD\_Premium". |  |
|  |  | policyTemplateId | ResourceId | 1..1 | RO | The resource identifier of a Policy Template tagged with externalReference that is in the READY state. |  |
|  |  | pduSetMarking | boolean | 0..1 | RO | If true, indicates that PDU Set marking applies to Dynamic Policy Instances based on policyTemplateId.Default value false if omitted. |  |
|  |  | bdtWindows | array(BDTWindow) | 0..1 | RO | A list of Background Data Transfer time windows, during which the application may request the activation of a Background Data Transfer by instantiating the Policy Template identified by policyTemplateId. The actual usage quotas for data volume and bit rate are determined upon instantiation of the Policy Template by the Media Client.BDTWindow is specified in clause 7.3.3.14. |  |
|  | sdfMethods | array(SdfMethod) | 1..1 | RO | A list of Service Data Flow description methods, e.g. 5-tuple, ToS, 2-tuple, etc., which should be used by the Media Session Handler to describe the Service Data flows at reference point M2 for media delivery sessions. |  |
| clientMetricsReporting‌Configurations | array(object) | 0..1 | RO | Present if QoE metrics reporting is provisioned in the parent Provisioning Session.If present, contains one or more client metrics reporting configurations. | MS\_DOWNLINK,MS\_UPLINK,RTC |
|  | metricsReporting‌ConfigurationId | ResourceId | 1..1 | RO | The identifier of this metrics reporting configuration, unique within the scope of the parent Provisioning Session.The value shall be the same as the corresponding identifier provisioned at reference point M1 (see clause 8.10.3.1). |
|  | serverAddresses | array(AbsoluteUrl) | 1..1 | RO | A list of Media AF addresses to which metrics reports shall be sent. See NOTE.Each address shall be an opaque base URL, following the format specified in clause 7.1.3 up to and including the {apiVersion} path element. |
|  | scheme | Uri | 1..1 | RO | A URI identifying the metrics scheme that metrics reports shall use (see clause 5.2.10). |
|  | dataNetworkName | Dnn | 0..1 | RO | The name of the Data Network which shall be used to send metrics reports.If not specified, the default DN shall be used. |
|  | reportingInterval | DurationSec | 0..1 | RO | The time interval, expressed in seconds, between metrics reports being sent by the Media Session Handler. The value shall be greater than zero.When this property is omitted, a single final report shall be sent immediately after the media streaming session has ended. |
|  | samplePercentage | Percentage | 1..1 | RO | The percentage of media delivery sessions that shall report QoE metrics, expressed as a floating-point value between 0.0 and 100.0. |
|  | urlFilters | array(string) | 0..1 | RO | A non-empty list of Media Entry Point URL patterns for which QoE metrics shall be reported. The format of each pattern shall be a regular expression as specified in [ECMA262].If not specified, reporting shall be done for all media delivery sessions. |
|  | samplingPeriod | DurationSec | 1..1 | RO | The time interval the Media Client should wait between sampling the QoE metrics specified by this metrics reporting configuration. |
|  | metrics | array(Uri) | 0..1 | RO | A list of one or more QoE metrics, each indicated by a fully-qualified term from a controlled vocabulary, which shall be reported.If omitted, the complete (or default if applicable) set of metrics associated with the specified scheme shall be collected and reported. |
| networkAssistance‌Configuration | object | 0..1 | RO | Present if Network Assistance is provisioned in the parent Provisioning Session. | MS\_DOWNLINK,MS\_UPLINKRTC |
|  | serverAddresses | array(AbsoluteUrl) | 1..1 | RO | A list of Media AF addresses (URLs) that offer the APIs for AF-based Network Assistance at reference point M5. See NOTE.Each address shall be an opaque URL, following the format specified in clause 7.1.3 up to and including the {apiVersion} path element. |
| client‌EdgeResources‌Configuration | object | 0..1 | RO | Present only for Provisioning Sessions with client-driven edge computing management mode provisioned. | MS\_DOWNLINK,MS\_UPLINK,RTC |
|  | eligibilityCriteria | Edge‌Processing‌Eligibility‌Criteria | 0..1 | RO | Conditions for activating edge resources for media delivery sessions in the scope of the parent Provisioning Session. (See clause 7.3.3.8.) |
|  | easDiscoveryTemplate | EAS‌Discovery‌Template | 1..1 | RO | A template for the EAS discovery filter that shall be used by the EEC to discover and select a Media EAS instance to serve media delivery sessions at reference point M4 in the scope of the parent Provisioning Session. (See clause 9.2.3.2.) |
|  | easRelocation‌Requirements | M5EAS‌Relocation‌Requirements | 0..1 | RO | EAS relocation tolerance and requirements.If absent, the EEC shall assume that relocation is tolerated by all Media EAS instances in the scope of the parent Provisioning Session. (See clause 9.2.3.3.) |
| NOTE: In deployments where multiple instances of the Media AF expose the Media Session Handling APIs at reference point M5, the 5G System may use a suitable mechanism (e.g., HTTP load balancing or DNS-based host name resolution) to direct requests to a suitable Media AF instance. |

Next change

#### 9.3.3.1 DynamicPolicy resource

Table 9.3.3.1-1: Definition of Dynamic Policy Instance resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Property name | Data type | Cardinality | Usage | Description |
| dynamicPolicyId | ResourceId | 1..1 | RO | Unique identifier for this Dynamic Policy Instance assigned by the Media AF when the resource is created. |
| provisioningSessionId | ResourceId | 1..1 | C: ROR: ROU: RO | Uniquely identifies the parent Provisioning Session, which is linked to the Application Service Provider. |
| session‌Id | MediaDelivery‌SessionId | 1..1 | C: RWR:ROU: RO | Unique identifier of the current media delivery session assigned by the Media Session Handler. |
| policyTemplateId | ResourceId | 1..1 | C: RWR: ROU: RW | Identifies the Policy Template to be applied to the application flow(s) that fall within the scope of this Dynamic Policy Instance. |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| applicationFlowBindings | array(Application‌FlowBinding) | 1..1 | C: RWR: ROU: RW | The bindings between application flows at reference point M4 managed within the scope of this Dynamic Policy Instance and their network Quality of Service requirements.The array shall contain at least one member. |
|  | application‌Flow‌Specification | Application‌Flow‌Description | 1..1 | C: RWR: ROU: RW | The Media Client's specification of an application flow managed by this Dynamic Policy to be used for application traffic identification purposes in the 5G Core (see clause 7.3.3.2).When PDU Set handling is enabled for the Policy Template identified by policyTemplateId, this property shall also specify the media transport protocol parameters to be used by the Media Access Function for PDU Set signalling purposes. |
|  | qos‌Specification | M5‌QoS‌Specification | 0..1 | C: RWR: ROU: RW | The Media Client's network Quality of Service requirements of the application flow described by application‌Flow‌Specification.If omitted, the default provisioned network Quality of Service requirements of the Policy Template indicated in policyTemplateId shall apply to application‌Flow‌Specification. |
| bdtSpecification | M5‌BDT‌Specification | 0..1 | C: RWR: ROU: RW | The Background Data Transfer time windows and traffic limits that apply to this Dynamic Policy. |
| qosEnforcement | boolean | 1..1 | C: ROR: ROU: RO | Indication that the Quality of Service described in qosSpecification is being enforced by the 5G System.Populated by the Media AF. |

Next change

#### 9.4.3.1 NetworkAssistanceSession resource

Table 9.4.3.1-1: Definition of NetworkAssistanceSession resource

| Property name | Type | Cardinality | Usage | Description |
| --- | --- | --- | --- | --- |
| naSessionId | ResourceId | 1..1 | C: ROR: ROU: RO | Unique identifier for this Network Assistance Session assigned by the Media AF when the resource is created. |
| provisioningSessionId | ResourceId | 1..1 | C: ROR: ROU: RO | Uniquely identifies the parent Provisioning Session, which is linked to the Application Service Provider. |
| session‌Id | MediaDelivery‌SessionId | 1..1 | C: RWR:ROU: RO | Unique identifier of the current media delivery session assigned by the Media Session Handler. |
| application‌Flow‌Description | Application‌Flow‌Description | 1..1 | C: RWR: ROU: RW | Identifying the application flow for which Network Assistance is sought, e.g. 2‑tuple (IP address pair) or 5-tuple (IP address pair, port pair and protocol). |
|  |  |  |  |  |
| policyTemplateId | ResourceId | 0..1 | C: RWR: ROU: RW | Identification of the policy (if any) that is currently in force for the media delivery session. |
| requestedQoS | M5QoSSpecification | 0..1 | C: RWR: ROU: RW | The QoS parameters requested by the Media Session Handler. |
| recommendedQoS | M5QoSSpecification | 0..1 | C: ROR: ROU: RO | The QoS parameters currently recommended by the Media AF. |
| notficationURL | AbsoluteUrl | 0..1 | C: ROR: ROU: RO | A URL to the MQTT channel, nominated by the Media AF, over which notifications are to be sent by the Media AF for this session. |

NEXT CHANGE

## A.3.9 Maf\_Provisioning\_RealTimeCommunication API

For the purpose of referencing entities specified in this clause, it shall be assumed that the OpenAPI definitions are contained in a physical file named "TS26510\_Maf\_Provisioning\_RealTimeCommunication.yaml".

NEXT CHANGE

# C.3 Procedure for using TOS Traffic Class for traffic identification

(Snip)

2. The Media Delivery Client activates a Dynamic Policy (see clause 9.3). Each applicationFlowBindings.‌applicationFlowSpecification contains a packetFilter object of data type IpPacketFilterSet, where the srcIp, toSTc, dstIP properties are present. The filter for a bi-directional application flow requires two such application flow bindings, one with IpPacketFilterSet.‌direction set to in and one with IpPacketFilterSet.‌direction set to out.

(Snip)

END OF CHANGES