**3GPP TSG-S4 Meeting ad hoc post # 127 S4aI240030**

**Online, 22nd February–28th March 2024** *revision of S4-240368*

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| *CR-Form-v12.2* | | | | | | | | |
| **PSEUDO CHANGE REQUEST** | | | | | | | | |
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|  | **26.510** | **CR** |  | **rev** |  | **Current version:** | **1.0.2** |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network | **X** |

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| ***Title:*** | [5GMS\_Pro\_Ph2] RTC-related Procedures in 5G Media | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Qualcomm Inc., BBC | | | | | | | | | |
| ***Source to TSG:*** | S4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5GMS\_Pro\_Ph2 | | | | |  | ***Date:*** | | | 2024-03-19 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | B |  | | | | | ***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 can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
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| ***Reason for change:*** | | Updates to the common procedures to support RTC are not incorporated into 26.510. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | |  | | | | | | | | |
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| ***Consequences if not approved:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | |  | | | | | | | | |
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|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  |  | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  |  | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  |  | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | S4aI240030: Tidying and additional BBC comments. | | | | | | | | |

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| **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].

5GC 5G Core

AF Application Function

ANBR Access Network Bit rate Recommendation

AS Application Server

EAS Edge Application Server

EEC Edge Enabler Client

EES Edge Enabler Server

QoE Quality of Experience

RTC Real-Time (media) Communication

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| **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 additionally provision a 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) 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.

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| **Next Change** |

## 5.2.9A Real-time Media Communication provisioning

#### 5.2.9A.1 General

#### 5.2.9A.2 Create Real-time Media Communication Configuration resource operation

#### 5.2.9A.3 Retrieve Real-time Media Communication Configuration resource operation

#### 5.2.9A.4 Update Real-time Media Communication Configuration resource operation

#### 5.2.9A.5 Destroy Real-time Media Communication Configuration resource operation

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| **Next Change** |

## 5.3 Network media session handling (M3, M5) interactions

### 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 downlink media delivery includes a media entry point (e.g. a URL to a DASH MPD or a URL to a progressive download file) that can be consumed by the Media Access Function and is handed to the Media Access Function via reference point M7.

- The Service Access Information for real-time media communication (RTC) 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.

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| **Next Change** |

#### 7.3.3.4A M5RTCQoSSpecification type

Table 7.3.3.4A-1: Definition of type M5RTCQoSSpecification type

|  |  |  |  |
| --- | --- | --- | --- |
| Property name | Data type | Cardinality | Description |
| mediaIdentifier | string | 1..1 | Provides an identifier for the media stream to associate with the corresponding service component in the QoS Policy. |
| marBwDlBitRate | BitRate | 1..1 | Maximum requested bit rate for the Downlink. |
| marBwUlBitRate | BitRate | 1..1 | Maximum requested bit rate for the Uplink. |
| minDesBwDlBitRate | BitRate | 0..1 | Minimum desired bit rate for the Downlink. |
| minDesBwUlBitRate | BitRate | 0..1 | Minimum desired bit rate for the Uplink. |
| mirBwDlBitRate | BitRate | 1..1 | Minimum requested bit rate for the Downlink. |
| mirBwUlBitRate | BitRate | 1..1 | Minimum requested bandwidth for the Uplink. |
| desLatency | integer | 0..1 | Desired Latency. |
| desLoss | integer | 0..1 | Desired Loss Rate. |
| pduSetMarking | PDUSetMarking | 0..1 | An object that contains the PDU Set marking configuration information. |

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| **Next Change** |

#### 7.3.4.3 ProvisioningSessionType enumeration

Table 7.3.4.3‑1: Definition of ProvisioningSessionType enumeration

|  |  |
| --- | --- |
| Enumeration value | Description |
| DOWNLINK | Downlink media streaming |
| UPLINK | Uplink media streaming |
| RTC | Real-time media communication (RTC) |

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| **Next Change** |

## 8.1 Overview

This clause defines the provisioning API used by a Media Application Provider at reference point M1 to configure downlink or uplink Media Delivery services. The corresponding OpenAPI definitions are specified in clause A.3. A summary of the resource structure is shown in table 8.1‑1 below.

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 |  |  |  |  | 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-publication-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 |  | 8.9A.2 | A.3.8A |
| metrics-reporting-configuration | Metrics Reporting Configuration collection | POST |  |  |  |  | 8.10.2 | A.3.9 |
| {metricsReportingConfigurationId} | Metrics Reporting Configuration resource |  | GET | PUT, PATCH | DELETE |  |
| consumption-reporting-configuration | Consumption Reporting Configuration resource | POST | GET | PUT, PATCH | DELETE |  | 8.11.2 | A.3.10 |
| event-data-processing-configurations | Event Data Processing Configuration collection | POST |  |  |  |  | 8.12.2 | A.3.11 |
| {event‌Data‌Processing‌ConfigurationId} | Event Data Processing Configuration resource |  | GET | PUT, PATCH | DELETE |  |

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| **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: RO  R: RO U: – | A unique identifier for this Provisioning Session. | All types. |
| provisioningSession‌Type | Provisioning‌Session‌Type | 1..1 | C: RW R: RW U: – | The type of Provisioning Session. | All types. |
| aspId | AspId | 0..1 | C: RW  R: RW U: – | 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: RW R: RW U: – | 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. |
| serverCertificateIds | array(ResourceId) | 0..1 | C: RO  R: RO U: – | A list of Server Certificate identifiers currently associated with this Provisioning Session. | DOWNLINK, UPLINK |
| contentPreparation‌TemplateIds | array(ResourceId) | 0..1 | C: RO  R: RO U: – | A list of Content Preparation Template identifiers currently associated with this Provisioning Session. | DOWNLINK, UPLINK |
| metricsReporting‌ConfigurationIds | array(ResourceId) | 0..1 | C: RO  R: RO U: – | A list of Metrics Reporting Configuration identifiers currently associated with this Provisioning Session. | DOWNLINK, UPLINK, RTC |
| policyTemplateIds | array(ResourceId) | 0..1 | C: RO  R: RO U: – | A list of Policy Template identifiers currently associated with this Provisioning Session. | DOWNLINK, UPLINK, RTC |
| edgeResources‌ConfigurationIds | array(ResourceId) | 0..1 | C: RO  R: RO U: – | A list of Edge Resources Configuration identifiers currently associated with this Provisioning Session. | DOWNLINK, UPLINK, RTC |
| eventDataProcessing‌ConfigurationIds | array(ResourceId) | 0..1 | C: RO  R: RO U: – | A list of Event Data Processing Configuration identifiers currently associated with this Provisioning Session. | DOWNLINK, UPLINK |

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| **Next Change** |

#### 8.7.3.1 PolicyTemplate resource

Table 8.7.3.1-1: Definition of PolicyTemplate resource

| Property | | | Type | Cardinality | Usage | Description |
| --- | --- | --- | --- | --- | --- | --- |
| policyTemplateId | | | ResourceId | 1..1 | C: RO R: RO U: RO | Resource identifier of this Policy Template assigned by the Media AF that is unique within the scope of the Provisioning Session. |
| state | | | string enum | 1..1 | C: RO R: RO U: RO | Current state of this Policy Template (see clause 5.2.7.2) exposed to the 5GMS Application Provider by the Media AF.  Only a Policy Template in the READY state may be instantiated as a Dynamic Policy Instance and applied to media streaming sessions. |
| stateReason | | | Problem‌Details | 1..1 | C: RO R: RO U: RO | Additional details about the current state of this Policy Template exposed to the Media Application Provider by the Media AF.  The instance sub-property shall be present and shall indicate the URL of this Policy Template resource at reference point M1.  The title sub-property shall be present and shall indicate a human-readable representation of the state property specified above, e.g., "Policy Template ready for use" or "Policy Template invalid".  The detail sub-property shall be present and shall indicate a human-readable status/error message.  All other properties shall be omitted. |
| externalReference | | | string | 1..1 | C: RW R: RW U: RW | Additional identifier for this Policy Template, unique within the scope of its Provisioning Session, that may be cross-referenced with external metadata about a media delivery session.  Example: "HD\_Premium". |
| application‌Session‌Contexts | | | array(object) | 0..1 | C: RW R: RW U: RW | Exactly one application session context at reference point M4 to which this Policy Template may be applied.  Each object in the array shall specify at least one property. If more than one property is specified, instantiation of the Policy Template is restricted to the conjunction of all the object's properties. |
|  | sliceInfo | | Snssai | 0..1 | C: RW R: RW  U: RW | A Network Slice on which this Policy Template may be instantiated. See clause 5.4.4.2 of TS 29.571 [29571]. |
|  | dnn | | Dnn | 0..1 | C: RW R: RW  U: RW | A Data Network on which this Policy Template may be instantiated. (See clause 7.3.2.) |
| qoSSpecification | | | M1‌QoS‌Specification | 0..1 | C: RW R: RW U: RW | The network Quality of Service policy to be applied to media delivery sessions that instantiate this Policy Template (see NOTE and clause 7.3.3.3). |
| rtc‌Qos‌Specification | | array(M1RTCQoSSpecification) | | 0..1 | C: RW R: RO U: RW | Specifies the network quality of service to be applied to the different media streams of the RTC session. The RTCQoSSpecification object is defined in table 8.7.3-2. |
| charging‌Specification | | | Charging‌Specification | 0..1 | C: RW R: RW  U: RW | The charging policy to be applied to media delivery sessions that instantiate this Policy Template is instantiated (see NOTE). |
| NOTE: At least one of qoSSpecification and charging‌Specification shall be present. | | | | | | |

#### 8.7.3.2 M1RTCQoSSpecification type

Table 8.7.3.2-1: Definition of M1RTCQoSSpecification type

|  |  |  |  |
| --- | --- | --- | --- |
| Property name | Data type | Cardinality | Description |
| marBwDlBitRate | BitRate | 1..1 | Maximum requested bit rate for the Downlink. |
| marBwUlBitRate | BitRate | 1..1 | Maximum requested bit rate for the Uplink. |
| minDesBwDlBitRate | BitRate | 0..1 | Minimum desired bit rate for the Downlink. |
| minDesBwUlBitRate | BitRate | 0..1 | Minimum desired bit rate for the Uplink. |
| mirBwDlBitRate | BitRate | 1..1 | Minimum requested bit rate for the Downlink. |
| mirBwUlBitRate | BitRate | 1..1 | Minimum requested bandwidth for the Uplink. |
| desLatency | number | 0..1 | Desired Latency. |
| desLoss | Percentage | 0..1 | Desired Loss Rate. |
| desPduSetLatency | number | 0..1 | Desired PDU Set latency. |
| desPduSetLoss | Percentage | 0..1 | Desired PDU Set Loss Rate. |
| PduSetIntegratedInfo | boolean | 0..1 | Indicates whether all PDUs of the PDU Set are needed for the usage of the PDU Set by the application layer in the receiver side. |
| activatePDUSetMarking | boolean | 0..1 | Indicates if PDU Set marking is to be activated for the corresponding streams. |
| protocolDescription | ProtocolDescription | 0..1 | A description of the protocol(s) used for the service data flow, which is used for the PDU Set and End of Burst marking configuration and identification as defined in clause 5.5.4.13 of TS 29.571 [y]. |

The ProtocolDescription type defined in TS 29.244 [x] and TS 29.571 [y] includes the following parts:

- Transport Protocol, indicating the transport protocol used for the media flow.

- RTP Header Extension Information, indicating the RTP header extension to be used for PDU Set and/or End of Data Burst identification if RTP/SRTP is used.

- RTP Payload Information, indicating the RTP payload information for the RTP stream which can be used to derive the PDU Set information and/or the End of Data Burst.

When the RTP Header Extensions for PDU Set Marking is activated for the media flow, the RTP Header Extension Information shall indicate the PDU Set marking configuration. The corresponding PDUSetMarking object is defined in table 8.3.7.2‑1.

Editor’s Note: How to link the PDUSetMarking object and the RTP Header Extension Information in the ProtocolDescription depends on further progress in CT3/4 WGs.

#### 8.7.3.2 PDUSetMarking type

Table 8.7.3.3-1: Definition of PDUSetMarking type

|  |  |  |  |
| --- | --- | --- | --- |
| Property name | Data type | Cardinality | Description |
| headerExtensionVersion | integer | 1..1 | The RTP header extension version. |
| localIdentifier | integer | 1..1 | A unique identifier of the RTP header extension in the scope of the media delivery session. |
| longHeaderFormat | boolean | 0..1 | Indicates if a short or a long header extension format is used. When set to false, a short 1-byte header extension format is being used. |
| pduSetSizeActive | boolean | 0..1 | A flag to indicate if the PDU Set size in bytes is present in the RTP header extension. |
| numPdusInPduSetActive | boolean | 0..1 | A flag to indicate if the Number of PDUs in the PDU Set is present in the RTP header extension. |

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| **Next Change** |

## 8.9A Real-time Media Communication provisioning API

### 8.9A.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 8.9A.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 advertisement of trusted RTC support services such as STUN, TURN, and SWAP. Additionally, it may provide a set of RTC functions that are maintained by the Application Provider.

### 8.9A.2 Resource structure

Editor's Note: Provide missing base path and table of operations.

### 8.9A.3 Data model

#### 8.9A.3.1 RTCM1Configuration resource

Table 10.1-1: Definition of RTCConfiguration resource

| Property name | Data Type | Cardinality | Description |
| --- | --- | --- | --- |
| offerStunServers | boolean | 0..1 | Indicates whether the Media AF should provide a list of trusted STUN servers to the Media Session Handler for use in RTC-based media delivery sessions initiated in the context of the parent Provisioning Session. |
| stunServerEndpoints | array(Endpoint‌Access) | 0..1 | A list of trusted STUN server endpoints that may be used as ICE candidates for RTC-based media delivery sessions.  If present, the array shall contain at least one object. |
| offerTurnServers | boolean | 0..1 | Indicates whether the Media AF should provide a list of trusted TURN servers to the Media Session Handler for use in RTC-based media delivery sessions initiated in the context of the parent Provisioning Session. |
| turnServerEndpoints | array(Endpoint‌Access) | 0..1 | A list of trusted TURN server endpoints that may be used as ICE candidates for RTC-based media delivery sessions.  If present, the array shall contain at least one object. |
| offerSwapServers | boolean | 0..1 | Indicates whether the Media AF should provide a list of trusted SWAP servers to the Media Session Handler for use in RTC-based media delivery sessions initiated in the context of the parent Provisioning Session. |
| swapServerEndpoints | array(Endpoint‌Access) | 0..1 | A list of trusted WebRTC signalling server endpoints that support the SWAP protocol. If provided, the application shall use one of the listed servers for RTC sessions of this application provider.  If present, the array shall contain at least one object. |

#### 8.9A.3.2 EndpointAccess

Table 10.1-1: Definition of EndpointAccess resource

| Property name | | Data Type | Cardinality | Description |
| --- | --- | --- | --- | --- |
| ipv4Address | | string |  |  |
| Ipv6Address | | string |  |  |
| domainName | | string |  | Fully-Qualified Domain Name of the server endpoint. |
| ports | | array(Uint16) |  |  |
| authentication | | object |  |  |
|  | username | string |  |  |
|  | credentials | string |  |  |

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| **Next Change** |

#### 8.10.3.1 MetricsReportingConfiguration resource

Table 8.10.3‑1: Definition of MetricsReportingConfiguration resource

| Property name | Type | Cardinality | Description |
| --- | --- | --- | --- |
| metricsReportingConfigurationId | ResourceId | 1..1 | An identifier for this Metrics Reporting Configuration assigned by the Media AF that is unique within the scope of the enclosing Provisioning Session. |
| scheme | Uri | 0..1 | The QoE metrics scheme associated with this Metrics Reporting Configuration.  Omitting this property signals to the Media AF that metrics reporting is currently disabled for the Provisioning Session in question. |
| dataNetworkName | Dnn | 0..1 | Identifies the Data Network which shall be used when sending metrics reports.  If not specified, the default Data Network shall be used. |
| reportingInterval | DurationSec | 0..1 | The time interval between successive metrics reports to be sent by the Media Session Handler. The value shall be greater than zero.  If not specified, a single final report shall be sent after the media delivery session has ended. |
| samplePercentage | Percentage | 0..1 | The proportion of media delivery sessions for which QoE metrics shall be reported, expressed as a floating-point value between 0.0 and 100.0.  If not specified, reports shall be sent for all media delivery sessions. |
| urlFilters | array(string) | 0..1 | If present, a non-empty list of Media Entry Point URL patterns for which QoE metrics shall be reported.  If not specified, reporting shall be done for all media delivery sessions initiated within the scope of the parent Provisioning Session. |
| samplingPeriod | DurationSec | 1..1 | The time interval the Media Client should wait between sampling the QoE metrics specified by this Metrics Reporting Configuration. |
| metrics | array(String) | 0..1 | If present, a non-empty list of QoE metrics which shall be collected and reported by the Media Client.  A controlled vocabulary of QoE metrics shall be specified by each metrics scheme for use with this property.  If omitted, the complete (or default, as applicable) set of metrics associated with the specified metrics scheme shall be collected and reported. |

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| **5th 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 assigned by the Media AF. |
| provisioningSessionId | ResourceId | 1..1 | C: RW R: RO U: RW | Provisioning Session identifier obtained from Service Access Information (see clause 11.2.3).  Uniquely identifies a Provisioning Session, which is linked to the Application Service Provider. |
| policyTemplateId | ResourceId | 1..1 | C: RW R: RO U: RW | Identifies the Policy Template to be applied to the application flow(s). |
| serviceDataFlowDescriptions | array(Service‌Data‌Flow‌Description) | 1..1 | C: RW R: RO U: RW | Describes the Service Data Flows managed by this Dynamic Policy. |
| mediaType | MediaType | 0..1 | C: RW R: RO U: RW | The type of media carried by the application flows listed in service‌DataFlow‌Descriptions. |
| qosSpecification | M5‌QoS‌Specification | 0..1 | C: RW R: RO U: RW | The network Quality of Service requirements of this Dynamic Policy (see clause 7.3.3.4). |
| rtcQoSSepcification | M5RTCQoSSpecification | 0..1 | C: RW R: RO U: RW | The QoS parameters for the dynamic policy to be applied to the RTC stream. |
| qosEnforcement | Boolean | 1..1 | C: RO R: RO U: RO | Indication that the Quality of Service described in qosSpecification is being enforced by the 5G System. |

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| **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. |
| streamingAccess | | | object | 0..1 | RO | Present if Content Hosting or Content Publishing is provisioned in the parent Provisioning Session. | 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. |  |
|  |  | 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. | DOWNLINK |
| rtcClientConfiguration | | | object | 0..1 | RO | Present if real-time media communication (RTC) is provisioned. | RTC |
|  | stunServerEndpoints | | array(EndpointAddress) | 0..1 |  | An array of trusted STUN servers that the application can use as ICE candidates. |  |
|  | turnServerEndpoints | | array(EndpointAddress) | 0..1 |  | An array of trusted TURN servers that the application can use as ICE candidates. |  |
|  | swapServerEndpoints | | array(EndpointAddress) | 0..1 |  | An array of trusted WebRTC signalling servers that support the SWAP protocol. If provided, the application shall use one of the listed servers for RTC sessions of this application provider. |  |
| clientConsumptionReporting‌Configuration | | | object | 0..1 | RO | Present if consumption reporting is activated for this Provisioning Session. | 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. |
|  |  | locationReporting | boolean | 1..1 | RO | Indicates whether the Media Session Handler is required to provide location data in consumption reporting messages (in case of MNO or trusted third parties).  Shall be set false if the locationReporting parameter is omitted from the Consumption‌Reporting‌Configuration, as specified in table 8.11.3.1‑1. |
|  |  | 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. | DOWNLINK, 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. |  |
|  | 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. | DOWNLINK, 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(string) | 1..1 | RO | A list of QoE metrics which shall be reported.  If empty, 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. | DOWNLINK, UPLINK  RTC |
|  | 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. | DOWNLINK, 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. | | | | | | | |

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| **Next Change** |

## A.3.8A 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".