**SA4-e (AH) MBS SWG post 111-e *S4aI201112***

**17th December 2020**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.0* | | | | | | | | |
| **Draft CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **26.512** | **CR** | **-** | **rev** | **-** | **Current version:** | **16.1.0** |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
|  | | | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network | **X** |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | Corrections on Procedures and APIs for Downlink and Uplink Streaming | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Qualcomm Incorporated, BBC | | | | | | | | | |
| ***Source to TSG:*** | SA4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5GMS3 | | | | |  | ***Date:*** | | | 2020-12-14 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-16 |
|  | *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-12 (Release 12)* *Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | There are a number of bugs in the terminology and description of the procedures and APIs for downlink streaming in certain sub-clauses of clause 4. More significant bugs and shortcomings exist in the sub-clauses of clauses 7 and 11 in terms of missing consideration for and related descriptions on, in the M1 and M5 APIs, uplink streaming services support by the 5GMS system. In addition, a few bugs are present in the described procedures for uplink streaming in sub-clause 5.2. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Proposed corrections to the cited bugs in these sections of TS 26.512. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Remaining inaccuracies in TS 26.512 regarding normative descriptions of procedures and APIs. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 4.2, 4.3, 5.2, 6.4.4, 7, 11 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
| ***56*** | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

1st CHANGE: Correction to sub-clauses 4.2 and 4.3

## 4.2 APIs relevant to Downlink Streaming

Table 4.2‑1 summarises the APIs used to provision and use the various downlink streaming features specified in TS 26.501 [2].

Table 4.2‑1: Summary of APIs relevant to downlink streaming features

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 5GMSd feature | Abstract | Relevant APIs | | |
| Interface | API name | Clause |
| Content Hosting | Content is ingested, hosted and distributed by the 5GMSd AS according to a Content Hosting Configuration associated with a Provisioning Session. | M1d | Provisioning Sessions API | 7.2 |
| Server Certificates Provisioning API | 7.3 |
| Content Preparation Templates Provisioning API | 7.4 |
| Content Protocols Discovery API | 7.5 |
| Content Hosting Provisioning API | 7.6 |
| M2d | HTTP-pull based content ingest protocol | 8.2 |
| DASH-IF push based content ingest protocol | 8.3 |
| M4d | DASH [4] or 3GP [37] | 10 |
| M5d | Service Access Information API | 11.2 |
| Metrics reporting | The 5GMSd Client uploads metrics reports to the 5GMSd AF according to a provisioned Metrics Reporting Configuration it obtains from the Service Access Information for its Provisioning Session. | M1d | Provisioning Sessions API | 7.2 |
| Metrics Reporting Configuration API | 7.8 |
| M5d | Service Access Information API | 11.2 |
| Metrics Reporting API | 11.4 |
| Consumption Reporting | The 5GMSd Client provides feedback reports on currently consumed content according to a provisioned Consumption Reporting Configuration it obtains from the Service Access Information for its Provisioning Session. | M1d | Provisioning Sessions API | 7.2 |
| Consumption Reporting Provisioning API | 7.7 |
| M5d | Service Access Information API | 11.2 |
| Consumption Reporting API | 11.3 |
| Dynamic Policy invocation | The 5GMSd Client activates different traffic treatment policies selected from a set of Policy Templates configured in its Provisioning Session. | M1d | Provisioning Sessions API | 7.2 |
| Policy Templates Provisioning API | 7.9 |
| M5d | Service Access Information API | 11.2 |
| Dynamic Policies API | 11.5 |
| Network Assistance | The 5GMSd Client requests bit rate recommendations and delivery boosts from the 5GMSd AF. | M5d | Service Access Information API | 11.2 |
| Network Assistance API | 11.6 |

## 4.3 Procedures of the M1d (5GMS Provisioning) interface

*---- <snipped> ----*

### 4.3.3 Content Hosting Configuration procedures

#### 4.3.3.1 General

These procedures are used by the 5GMSd Application Provider and the 5GMSd AF on M1d to configure the content hosting feature for downlink streaming.

*---- <snipped> ----*

### 4.3.5 Content Preparation Template procedures

#### 4.3.5.1 General

The 5GMSd AS is able to process content ingested at interface M2d before serving it on interface M4d, as described in clause 7.4.1. The content processing operations are specified in a Content Preparation Template resource, as specified in clause 7.4.2.

*---- <snipped> ----*

### 4.3.9 Metrics Reporting Configuration procedures

#### 4.3.9.1 General

These procedures are used by the 5GMSd Application Provider to configure QoE metrics reporting functionality associated with downlink streaming. This clause defines the basic procedures. More details are provided in clause 7.8.

A given instance of a Metrics Reporting Configuration is identified by the metricsReportingConfigurationId property of the MetricsReportingConfiguration resource, The properties of that resource, as described in clause 7.8.3.1, pertain to metrics collection and reporting by the Media Session Handler to the 5GMS AF.

*---- <snipped> ----*

END OF 1st CHANGE

2nd CHANGE: Corrections to sub-clauses 5.2

## 5.2 APIs relevant to Uplink Streaming

Table 5.2‑1 summarises the APIs used to provision and use the various uplink streaming features specified in TS 26.501 [2].

Table 5.2‑1: Summary of APIs relevant to uplink streaming features

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 5GMSd feature | Abstract | Relevant APIs | | |
| Interface | API name | Clause |
| Metrics Reporting | The 5GMSu Client uploads metrics reports to the 5GMSu AF according to a provisioned Metrics Reporting Configuration it obtains from the Service Access Information for its Provisioning Session. | M1u | Provisioning Sessions API | 7.2 |
| Metrics Reporting Configuration API | 7.8 |
| M5u | Service Access Information API | 11.2 |
| Metrics Reporting API | 11.4 |
| Dynamic Policy invocation | The 5GMSu Client activates different traffic treatment policies selected from a set of Policy Templates configured in its Provisioning Session. | M1u | Provisioning Sessions API | 7.2 |
| Policy Templates Provisioning API | 7.9 |
| M5u | Service Access Information API | 11.2 |
| Dynamic Policies API | 11.5 |
| Network Assistance | The 5GMSu Client requests bit rate recommendations and delivery boosts from the 5GMSu AF. | M5u | Service Access Information API | 11.2 |
| Network Assistance API | 11.6 |

END OF 2nd CHANGE

3rd CHANGE: Additional enumerated data type under clause 6.4.4

### 6.4.4 Enumerated data types

#### 6.4.4.1 CellIdentifierType enumeration

The data model for the *CellIdentifierType* enumeration which indicates the type of cell identifier as defined in TS 23.003 [7], is specified in Table 6.4.4.1-1 below:

Table 6.4.4.1‑1: Definition of CellIdentifierType enumeration

|  |  |
| --- | --- |
| Enumeration value | Description |
| CGI | Cell Global Identification. |
| ECGI | E-UTRAN Cell Global Identification. |
| NCGI | NR Cell Global Identity. |

#### 6.4.4.2 SdfMethod enumeration

The data model for the SdfMethod enumeration is specified in Table 6.4.4.2-1 below:

Table 6.4.4.2‑1: Definition of SdfMethod enumeration

|  |  |
| --- | --- |
| Enumeration value | Description |
| 5Tuple | The Media Session Handler shall use 5-Tuples for Service Data Flow descriptions. The 5‑Tuple shall not contain a wildcard. |
| 2Tuple | The Media Session Handler shall use a 2-Tuple of UE IP and Server IP as Service Data Flow Description. |
| typeOfServiceMarking | The Media Session Handler shall apply Type of Service (ToS) marking to the Service Data Flow. |
| flowLabel | The Media Session Handler shall apply IPv6 flow label marking and provide the IPv6 flow label of the Service Data Flow. |
| domainName | The Media Session Handler shall provide the domain name of the 5GMSd AS. |

#### 6.4.4.3 ProvisioningSessionType enumeration

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

Table 6.4.4.3‑1: Definition of ProvisioningSessionType enumeration

|  |  |
| --- | --- |
| Enumeration value | Description |
| downlink | Downlink streaming |
| uplink | Uplink streaming |

END OF 3rd CHANGE

4th CHANGE: Corrections to sub-clauses of clause 7

# 7 Provisioning (M1) APIs

## 7.1 General

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

## 7.2 Provisioning Sessions API

### 7.2.1 Overview

The Provisioning Sessions API is used by the 5GMS Application Provider to instantiate and manipulate Provisioning Sessions in the 5GMS System, as described in clause 4.3.2. Having created a Provisioning Session, the 5GMS Application Provider can then go on to provision other 5GMS features in the context of that Provisioning Session, using the APIs specified in clause 7.3 *et seq*. Certain of these features are only applicable to the type of Provisioning Session created.

### 7.2.2 Resource structure

The Provisioning Sessions API is accessible through the following URL base path:

{apiRoot}/3gpp-m1/v1/provisioning-sessions/

Table 7.4.2‑1 specifies the operations and the corresponding HTTP methods that are supported by this API. In each case, the sub-resource path specified in the second column of the table shall be appended to the above URL base path.

Table 7.2.2‑1: Operations supported by the Provisioning Sessions API

|  |  |  |  |
| --- | --- | --- | --- |
| Operation | Sub‑resource path | Allowed HTTP method(s) | Description |
| Create Provisioning Session |  | POST | Used to create a new Provisioning Session resource.  If the operation succeeds, the URL of the created Provisioning Session resource shall be returned in the Location header of the response. |
| Retrieve Provisioning Session | {provisioningSessionId} | GET | Used to retrieve a Provisioning Session resource for inspection. |
| Destroy Provisioning Session | DELETE | Used to destroy an existing Provisioning Session resource. |

### 7.2.3 Data model

#### 7.2.3.1 ProvisioningSession resource

The data model for the ProvisioningSession resource is specified in Table 7.2.3.1-1 below. Different properties are present in the resource depending on the type of Provisioning Session indicated in the provisioningSessionType property, and this is specified in the *Applicability* column.

Table 7.2.3.1‑1: Definition of ProvisioningSession resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Property name | Type | Cardinality | Usage | Description | Applicability |
| provisioningSessionId | String | 1..1 | C: R  R: RO | A unique identifier for this Provisioning Session. | All types. |
| provisioningSession‌Type | Provisioning‌Session‌Type | 1..1 | C: RW R: RO  U: – | The type of Provisioning Session. | All types. |
| aspId | AspId | 0..1 | C: W  R: RO | The identity of the Application Service Provider responsible for this Provisioning Session, as specified in clause 5.6.2.3 of TS 29.514 [34]. | All types. |
| serverCertificateIds | Array(String) | 0..1 | C: –  R: RO | A list of Server Certificate identifiers currently associated with this Provisioning Session. | downlink,  uplink |
| contentPreparation‌TemplateIds | Array(String) | 0..1 | C: –  R: RO | A list of Content Preparation Template identifiers currently associated with this Provisioning Session. | downlink,  *uplink* |
| contentProtocols | String | 1..1 | C: R  R: RO | The Content Protocols resource identifier.  Fixed value specified as the sub-resource path in table 7.5.2‑1. | downlink,  uplink |
| contentHosting‌ConfigurationId | String | 0..1 | C: –  R: RO | The Content Hosting Configuration identifier currently associated with this Provisioning Session, if any. | downlink,  *uplink* |
| consumptionReporting‌ConfigurationId | String | 0..1 | C: –  R: RO | The Consumption Reporting Configuration identifier currently associated with this Provisioning Session, if any. | downlink |
| metricsReporting‌ConfigurationIds | Array(String) | 0..1 | C: –  R: RO | A list of Metrics Reporting Configuration identifiers currently associated with this Provisioning Session. | downlink,  uplink |
| policyTemplateIds | Array(String) | 0..1 | C: –  R: RO | A list of Policy Template identifiers currently associated with this Provisioning Session. | downlink,  uplink |

*---- <snipped> ----*

## 7.5 Content Protocols Discovery API

### 7.5.1 Overview

The Content Protocols Discovery API is used by a 5GMS Application Provider to find out which content ingest or egest protocols are supported by the 5GMS AS(s) associated with a 5GMS AF. One of the supported ingest protocols is subsequently indicated in a Content Hosting Configuration for downlink streaming.

### 7.5.2 Resource structure

The Content Protocols Discovery API is accessible through the following URL base path:

{apiRoot}/3gpp-m1/v1/provisioning-sessions/{provisioningSessionId}/

Table 7.5.2‑1 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 of the table shall be appended to the URL base path.

Table 7.5.2‑1: Operations supported by the Ingest Protocols Discovery API

|  |  |  |  |
| --- | --- | --- | --- |
| Operation | Sub‑resource path | Allowed HTTP method(s) | Description |
| Fetch list of supported content protocols | protocols | GET | This operation is used to retrieve a list of supported content protocols. |

### 7.5.3 Data model

#### 7.5.3.1 ContentProtocols resource

The data model for the ContentProtocols resource is specified in table 7.5.3.1-1 below:

Table 7.5.3.1-1: Definition of ContentProtocols resource

| Property name | Data Type | Cardinality | Description |
| --- | --- | --- | --- |
| downlinkIngestProtocols | Array(Content‌Protocol‌Descriptor) | 0..1 | An array of ContentProtocolDescriptor objects, as specified in clause 7.5.3.2, each one uniquely identifying a content ingest protocol supported at interface M2d by the 5GMSd AS(s) associated with the corresponding 5GMSd AF. |
| uplinkEgestProtocols | Array(Content‌Protocol‌Descriptor) | 0..1 | An array of ContentProtocolDescriptor objects, as specified in clause 7.5.3.2, each one uniquely identifying a content egest protocol supported at interface M2u by the 5GMSu AS(s) associated with the corresponding 5GMSu AF. |
| geoFencingLocatorTypes | Array(URI String) | 0..1 | An array of fully-qualified term identifiers, each one indicating a content geo-fencing locator type supported by the 5GMS System.  Every 5GMS System shall support at least the locator type urn:3gpp:5gms:locatortype:iso3166. |

#### 7.5.3.2 ContentProtocolDescriptor type

The data model for the *ContentProtocolDescriptor* type is specified in table 7.5.3.2-1 below:

Table 7.5.3.2-1: Definition of ContentProtocolDescriptor type

|  |  |  |  |
| --- | --- | --- | --- |
| Property name | Data Type | Cardinality | Description |
| termIdentifier | URI String | 1..1 | A fully-qualified term identifier from the controlled vocabulary urn:3gpp:5gms:content-protocol, as specified in clause 8. |
| descriptionLocator | URL String | 0..1 | The location of a description of the content protocol, for example the public web URL of its specification. |

*---- <snipped> ----*

## 7.7 Consumption Reporting Provisioning API

### 7.7.1 Overview

The Consumption Reporting Provisioning API is a RESTful API that allows a 5GMSd Application Provider to configure the downlink Consumption Reporting Procedure for a particular Provisioning Session at interface M1d. The different procedures are described in clause 4.2.5. The Consumption Reporting Configuration is represented by a ConsumptionReportingConfiguration, the data model for which is specified in clause 7.7.3 below. The RESTful resources for managing the Consumption Reporting Configuration is specified in clause 7.7.2.

*---- <snipped> ----*

## 7.8 Metrics Reporting Configuration API

### 7.8.1 Overview

The Metrics Reporting Configuration API allow an 5GMS System operator or a 5GMS Application Provider to configure the Metrics Collection and Reporting procedure for a particular Provisioning Session at interface M1.

### 7.8.2 Resource structure

The Metrics Reporting Configuration API is accessible through the following URL base path:

{apiRoot}/3gpp-m1/v1/provisioning-sessions/{provisioningSessionId}/

Table 7.8.2‑1 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 of the table shall be appended to the URL base path.

Table 7.8.2-1: Metrics Reporting Configuration resource

|  |  |  |  |
| --- | --- | --- | --- |
| Operation | Sub‑resource path | Allowed HTTP method(s) | Description |
| Create Metrics Reporting Configuration | metrics‑reporting‑configuration | POST | Create and optionally provide a configuration.  If the operation succeeds, the URL of the created Metrics Reporting Configuration resource shall be returned in the Location header of the response. |
| Read Metrics Reporting Configuration | metrics‑reporting‑configuration/  {metricsReportingConfigurationId} | GET | Retrieve the values of an existing Metrics Reporting Configuration. |
| Update Metrics Reporting Configuration | PUT,  PATCH | Provide initial upload of a new configuration, or either the modification of, or replacement to an existing configuration. |
| Delete Metrics Reporting Configuration | DELETE | Delete a configuration, disables reporting. |

### 7.8.3 Data model

#### 7.8.3.1 MetricsReportingConfiguration resource

The data model for the MetricsReportingConfiguration resource is specified in Table 7.8.3-1 below:

Table 7.8.3‑1: Definition of MetricsReportingConfiguration resource

|  |  |  |  |
| --- | --- | --- | --- |
| Property name | Type | Cardinality | Description |
| metricsReportingConfigurationId | String | 1..1 | An identifier for this Metrics Reporting Configuration that is unique within the scope of the enclosing Provisioning Session. |
| scheme | Array(URI String) | 0..1 | The scheme associated with this Metrics Reporting Configuration. A scheme may be associated with 3GPP or with a non-3GPP entity.  For downlink streaming, if not specified, the 3GPP metrics scheme urn:‌3GPP:‌ns:‌PSS:‌DASH:‌QM10 from TS 26.247 shall apply.  For uplink streaming, if not specified, the implication is that no associated uplink metrics reporting shall be performed. |
| dataNetworkName | String | 0..1 | The Data Network Name (DNN) which shall be used when sending metrics reports.  If not specified, the default DNN shall be used. |
| reportingInterval | DurationSec | 0..1 | The time interval between successive metrics reports.  If not specified, a single final report shall be sent after the streaming session has ended. |
| samplePercentage | Percentage | 0..1 | The proportion of streaming sessions for which metrics shall be reported.  If not specified, reports shall be sent for all sessions. |
| urlFilters | Array(String) | 0..1 | A non-empty list of content URL patterns for which metrics shall be reported.  If not specified, reporting shall be done for all URLs. |
| metrics | Array(String) | 0..1 | A non-empty list of metrics which shall be collected and reported.  In the case of downlink streaming and for the 3GPP scheme urn:‌3GPP:‌ns:‌PSS:‌DASH:‌QM10 the listed metrics shall correspond to one or more of the metrics as specified in clauses 10.3 and 10.4, respectively, of TS 26.247 [7], and the quality reporting scheme and quality reporting protocol as defined in clauses 10.5 and 10.6, respectively, of [7] shall be used.  If not specified, the complete (or default if applicable) set of metrics associated with the specified scheme shall be collected and reported. |

## 7.9 Policy Templates Provisioning API

### 7.9.1 Overview

The Policy Templates Provisioning API allow a 5GMS Application Provider to configure a set of Policy Templates within the scope of a Provisioning Session that can subsequently be applied to downlink or uplink media streaming sessions belonging to that Application Provider using the Dynamic Policies API specified in clause 11.5. A Policy Template is used to specify the traffic shaping and charging policies to be applied to these media streaming sessions.

A Policy Template, identified by its policyTemplateId, represents a set of PCF/NEF API parameters which defines the service quality and associated charging for the corresponding downlink or uplink media streaming session(s). The Policy Template is configured as part of the provisioning procedures with the 5GMS AF and is then used by the 5GMS AF to request specific QoS and charging policies for that session from the PCF or NEF.

The state of a Policy Template can be:

- pending: The Policy Template is awaiting validation, potentially because not all required parameters have yet been provided. This is the default state after Policy Template creation.

- invalid: One or more of the Policy Template's properties failed validation by the 5GMS AF.

- ready: After successful validation by the 5GMS AF the Policy Template moves into this state.

- suspended: The 5GMS AF may move a Policy Template into this state under certain conditions defined within the Service Level Agreement.

When the Policy Template is used for QoS Flows, the qoSSpecification object (of type M1QoSSpecification) shall be present:

- The qosReference value is obtained with the Service Level Agreement. See TS 23.502 for detailed usage.

- The maxBtrUl and maxBtrDl properties define the maximal bit rate which can be used for QoS Flows. This value is defined by the 5G System.

- The maxAuthBtrUl and MaxAuthBtrDl properties define the maximal authorized bit rate values which can be requested by a Media Session Handler. Higher bit rate values are not authorized for use by the 5GMS Application Provider.

- The minPacketLossRateDl and minPacketLossRateUl properties define the minimal authorized packet loss rate, which can be requested by a Media Session Handler.

When the Policy Template is used for differential changing the chargingSpecification property shall be present.

The ApplicationSessionContext Object is a mandatory object, which contains at least the aspId property.

- The aspId identifies the API invoker.

- The dnn property contains the Data Network Name of the data network, in which the 5GMS AF is hosted.

- When Network Slicing is used, the sliceInfo property contains information about the network slice, which is serving the UE.

### 7.9.2 Resource structure

The Policy Template Provisioning API is accessible through the following URL base path:

{apiRoot}/3gpp-m1/v1/provisioning-sessions/{provisioningSessionId}/

Table 7.9.2‑1 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 7.9.2‑1: Operations supported by the Policy Template Provisioning API

|  |  |  |  |
| --- | --- | --- | --- |
| Operation | Sub‑resource path | Allowed HTTP method(s) | Description |
| Create a new Policy Template | policy-templates | POST | Used to create a new Policy Template resource.  If the operation succeeds, the URL of the created Policy Template resource shall be returned in the Location header of the response. |
| Fetch a Policy Template | policy-templates/‌{policyTemplateId} | GET | Used to retrieve an existing Policy Template resource. |
| Update a Policy Template | PUT,  PATCH | Used to modify the configuration of an existing Policy Template. |
| Delete a Policy Template | DELETE | Used to delete an existing Policy Template resource. |

END OF 4th CHANGE

5th CHANGE: Corrections to sub-clauses of clause 11

# 11 Media Session Handling (M5) APIs

## 11.1 General

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

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

## 11.2 Service Access Information API

### 11.2.1 General

The Service Access Information API is used by the Media Session Handler to obtain configuration information from the 5GMS AF that enables it to use the other Media Session Handling APIs specified in clause 11.3 *et seq.*

### 11.2.2 Resource structure

The Service Access Information API is accessible through the following URL base path:

{apiRoot}/3gpp-m5/v1/service-access-information/

The operations and the corresponding HTTP methods in Table 11.2.2-1 are supported. In each case, the sub-resource path specified in the second column shall be appended to the URL base path.

Table 11.2.2‑1: Operations supported by the Service Access Information API

|  |  |  |  |
| --- | --- | --- | --- |
| Operation | Sub-resource path | Allowed HTTP method(s) | Description |
| Fetch Service Access Information | {provisioningSessionId} | GET | Used to acquire the Service Access Information resource for the specified Provisioning Session.  The {provisioningSessionId} uniquely identifies the Service Access Information Resource and is allocated by the 5GMS AF during creation of a Provisioning Session. |

### 11.2.3 Data model

#### 11.2.3.1 ServiceAccessInformation resource type

The data model for the ServiceAccessInformation resource is specified in Table 11.2.3.1-1 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 11.2.3.1‑1: Definition of ServiceAccessInformation resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Property name | Type | Cardinality | Usage | Description | Applicability |
| provisioningSessionId | String | 1..1 | RO | Unique identification of the M1 Provisioning Session. | All types |
| StreamingAccess | Object | 0..1 | RO |  | downlink |
| mediaPlayerEntry | URL String | 0..1 | RO | A document or a pointer to a document that defines a media presentation e.g. MPD for DASH content or URL to a video clip file. |
| ClientConsumptionReporting‌Configuration | Object | 0..1 | RO |  | downlink |
| 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 streaming session has ended. |
| serverAddresses | Array(URL String) | 1..1 | RO | A list of 5GMSd AF addresses (URLs) where the consumption reporting messages are sent by the Media Session Handler.  (Opaque URL, following the 5GMS URL format.) |
| locationReporting | Boolean | 1..1 | RO | Stipulates whether the Media Session Handler is required to provide location data to the 5GMSd AF in consumption reporting messages (in case of MNO or trusted third parties). |
| samplePercentage | Percentage | 1..1 | RO | The percentage of streaming sessions that shall send consumption reports, expressed as a floating point value between 0.0 and 100.0. |
| DynamicPolicyInvocationConfiguration | Object | 0..1 | RO |  | downlink |
| serverAddresses | Array(URL String) | 1..1 | RO | A list of 5GMSd AF addresses (URLs) which offer the APIs for dynamic policy invocation sent by the Media Session Handler.  (Opaque URL, following the 5GMS URL format.) |
| validPolicyTemplateIds | Array(String) | 1..1 | RO | A list of Policy Template identifiers which the 5GMS Client is authorized to use. |
| sdfMethods | Array(SdfMethod) | 1..1 | RO | A list of recommended service data flow description methods (descriptors), e.g. 5-Tuple, ToS, 2-Tuple, etc, which should be used by the Media Session Handler to describe the service data flows for the traffic to be policed. |
| externalReferences | Array(String) | 0..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 streaming session.  Example: "HD\_Premium". |
| ClientMetricsReportingConfigurations | Array(Object) | 0..1 | RO |  |  |
| serverAddresses | Array(URL String) | 1..1 | RO | A list of 5GMS AF addresses to which metrics reports shall be sent.  (Opaque URL, following the 5GMS URL format.) | downlink,  uplink |
| dataNetworkName | String | 0..1 | RO | The DNN which shall be used when sending metrics reports. If not specified, the name of the default DN shall be used. | downlink,  uplink |
| 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 streaming session has ended. | downlink,  uplink |
| samplePercentage | Percentage | 1..1 | RO | The percentage of streaming sessions that shall report metrics, expressed as a floating point value between 0.0 and 100.0. | downlink,  uplink |
| urlFilters | Array(String) | 0..1 | RO | A non-empty list of URL patterns for which metrics reporting shall be done. The format of each pattern shall be a regular expression as specified in [5].  If not specified, reporting shall be done for all sessions. | downlink,  uplink |
| metrics | Array(String) | 1..1 | RO | A list of metrics which shall be reported. | downlink,  uplink |
| NetworkAssistanceConfiguration | Object | 0..1 | RO |  | downlink,  uplink |
| serverAddress | URL String | 1..1 | RO | Address of the 5GMS AF that offers the APIs for 5GMS AF-based Network Assistance, for access by the 5GMSd Media Session Handler. This address shall be an opaque URL, following the 5GMS URL format. |

### 11.2.4 Operations

This clause defines the behaviour that is expected from the 5GMS AF when a Service Access Information resource is acquired by the Media Session Handler. The main operation that is performed is to look up or generate the Service Access Information corresponding to the requested Provisioning Session.

## 11.3 Consumption Reporting API

### 11.3.1 General

The Consumption Reporting API allows the Media Session Handler to report downlink media consumption to the 5GMSd AF. The API defines data models, resources and the related procedures for the creation and management of the consumption reporting procedures. This procedure is configured by the ServiceAccessInformation resource, as defined in clause 11.2.3.

*---- <snipped> ----*

## 11.4 Metrics Reporting API

### 11.4.1 General

The Metrics Reporting API allows the Media Session Handler to send metrics reports to the 5GMS AF. This procedure is configured by the ServiceAccessInformation resource, as defined in clause 11.2.3. Note that multiple metrics configurations can be active at the same time, each identified by a unique metricsReportingConfigurationId.

### 11.4.2 Reporting procedure

Metrics reports related to a specific metricsReportingConfigurationId shall be submitted to one of the URLs selected from the ClientMetricsReportingConfiguration.serverAddresses array of the ServiceAccessInformation resource (see clause 11.2.3). The path of the URL should conform to the following general format:

{apiRoot}/3gpp-m5/v1/metrics-reporting/{provisioningSessionId}/{metricsReportingConfigurationId}

where {provisioningSessionId} shall be substituted by the 5GMS Client with the relevant Provisioning Session identifier and {metricsReportingConfigurationId} shall be substituted with the relevant Metrics Reporting Configuration identifier.

The only HTTP method supported by this endpoint is POST.

### 11.4.3 Report format

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

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

## 11.5 Dynamic Policies API

### 11.5.1 Overview

The Dynamic Policies API allows the Media Session Handler to request a specific policy and charging treatment to be applied to a particular application data flow of a downlink or uplink streaming session by invoking RESTful operations on the 5GMS AF at interface M5. The API defines a set of data models, resources and the related procedures for the creation and management of the dynamic policy request.

### 11.5.2 Resource structure

The Dynamic Policies API is accessible through the following URL base path:

{apiRoot}/3gpp-m5/v1/dynamicpolicies/

Table 11.5.2‑1 below specifies the operations and the corresponding HTTP methods that are supported by this API. The sub-resource path specified in the second column shall be appended to the URL base path.

Table 11.5.2-1: Operations supported by the Dynamic Policies API

|  |  |  |  |
| --- | --- | --- | --- |
| Resource name | Sub-resource path | Allowed HTTP methods | Description |
| Dynamic Policies | policies | POST | Create a new Dynamic Policy resource.  If the operation succeeds, the URL of the created Dynamic Policy Instance resource shall be returned in the Location header of the response. |
| Dynamic Policy | policies/{dynamicPolicyId} | GET | Read a Dynamic Policy resource. |
| PUT | Replace an existing Dynamic Policy resource. |
| PATCH | Modify an existing Dynamic Policy resource. |
| DELETE | Delete an existing Dynamic Policy resource. |

*---- <snipped> ----*

### 11.5.4 Operations

This clause defines the behaviour that is expected when activating a Dynamic Policy Instance. The policyTemplateId uniquely identifies the Policy Template, to which the Dynamic Policy Instance is associated. The provisioningSessionId associates the Dynamic Policy Instance to a Provisioning Session.

The Dynamic Policy resource contains a serviceDataFlowDescription property which contains the service data flow template according to TS 23.503. The ServiceDataFlowDescription shall contain one of:

- a flowDescription Object (incl. 5-Tuples, Type of Service, Security Parameter Index, etc.).

- a domainName.

When the Media Session Handler activate a QoS-related Dynamic Policy Template, then the qosSpecifcation property shall be present and it shall contain the following properties:

- marBwDlBitRate or marBwUlBitRate, indicating the maximum requested bit rate by the Media Session Handler.

- mirBwDlBitRate or mirBwUlBitRate, indicating the minimum requested bit rate by the Media Session Handler.

- minDesBwDlBitRate or minDesBwUlBitrate, indicating the minimum bit rate desired by the Media Session Handler.

When the 5G System employs a traffic enforcement function to ensure that the traffic is complying a certain traffic policy, the Dynamic Policy resource may contain the following two properties:

- an enforcementMethod, indicating the type of enforcement method (like leaky bucket).

- an enforcementBitrate property, indicating the maximal permitted bit rate.

## 11.6 Network Assistance API

### 11.6.1 Overview

If AF-based Network Assistance is supported, then the Network Assistance API component of interface M5, as defined in the present sub-clause, is first used to provision a Network Assistance Session resource. The Network Assistance Resource can then be used to obtain bit rate recommendations and to issue delivery boost requests during the ongoing media streaming session.

### 11.6.2 Resource structure

The Network Assistance API is accessible via the following URL base path:

*{apiRoot}*/3gpp‑m5/v1/network-assistance/

Table 11.6.2‑1 below specifies the operations and the corresponding HTTP methods that are supported by this API. In each case, the sub-resource path specified in the second column of the table shall be appended to the URL base path.

Table 11.6.2-1: Operations supported by the Network Assistance API

|  |  |  |  |
| --- | --- | --- | --- |
| Operation | Sub‑resource path | Allowed HTTP method(s) | Description |
| Create Network Assistance Session resource |  | POST | Provision a new Network Assistance Session.  If the operation succeeds, the URL of the created Network Assistance Session resource shall be returned in the Location header of the response. |
| Fetch a Network Assistance Session resource | {naSessionId} | GET | Fetch the properties of an existing Network Assistance Session. |
| Update a Network Assistance Session resource | {naSessionId} | PUT,  PATCH | Update the properties of an existing Network Assistance Session. |
| Request a bit rate recommendation | {naSessionId}/recommendation | GET | Obtain a bit rate recommendation for the next recommendation window. |
| Request a delivery boost | {naSessionId}/boostRequest | POST | Request a delivery boost for the next recommendation window. |
| Terminate Network Assistance Session | {naSessionId} | DELETE | Terminate a Network Assistance session. |

*---- <snipped> ----*

### 11.6.4 Operations

The 5GMS Client uses the POST method to create a Network Assistance session with the 5GMS AF. The AF returns the Network Assistance session identifier if session setup was successful, otherwise an error code is returned without a Network Assistance session identifier.

The 5GMS Client uses the Network Assistance session resource identifier (naSessionId) provided by the AF to refer all subsequent API calls to the AF applicable to that Network Assistance session.

The 5GMS AF populates the Network Assistance session resource with the service data flow information and optionally the policy template id that are valid for the streaming session for which Network Assistance operations are to be performed. The AF uses this information to execute Network Assistance operations in the 5GC.

The 5GMS Client uses the GET method with the Network Assistance Session resource identifier to retrieve a Network Assistance Session resource from the 5GMS AF. The AF returns the Network Assistance Session resource if retrieval was successful, otherwise an appropriate error code is returned without the session resource in case of failure.

The 5GMS Client uses the GET method with the sub-resource path specified in Table 11.6.2‑1 to request a bit rate recommendation from the 5GMS AF. The 5GMS AF shall return the recommended bit rate in an HTTP response body of type M5QoSSpecification if a bit rate recommendation could be obtained, otherwise an appropriate HTTP error code shall be returned with no response body. For a downlink streaming session, the recommended minimum and maximum bit rates shall be indicated in the properties mirBwDlBitRate and marBwDlBitRate, respectively. For an uplink streaming session, the recommended minimum and maximum bit rates shall be indicated in the properties mirBwUlBitRate and marBwUlBitRate, respectively. If a unique recommendation is given by the 5GMSd AF then this recommended bit rate shall be set in both of these properties. The optional properties minDesBwDlBitRate, minDesBwUlBitRate, desLatency and desLoss shall not be included in the response.

The 5GMS Client uses the POST method with the sub-resource path specified in Table 11.6.2‑1 to request a delivery boost from the 5GMS AF. The 5GMS AF shall respond with the OperationSuccessResponse data type indicating whether or not the delivery boost will be attempted by the network within an upcoming nominal time period.

The 5GMS Client uses the PUT or PATCH methods to replace the existing steaming session parameters with new settings. The 5GMS AF returns the NetworkAssistanceSession resource with settings resulting from the PUT or PATCH update operation.

The 5GMS Client uses the DELETE method to terminate the indicated Network Assistance session. The 5GMS AF returns an appropriate response code. If the termination was successful, then any subsequent calls referring to the terminated session will result in the error 404 (Not Found).

END OF 4h CHANGE