**3GPP TSG-S4 Meeting #125*****S4-231156***

**Gothenburg, Sweden, 21st–25th August 2023** revision of S4aI230105

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **26.512** | **CR** | **0037** | **rev** | **1** | **Current version:** | **17.5.0** |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network | **X** |

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| ***Title:*** |  | | | | | | | | | |
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| ***Source to WG:*** | BBC | | | | | | | | | |
| ***Source to TSG:*** | S4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5GMS3, TEI17 | | | | |  | ***Date:*** | | | 2023-07-31 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-17 |
|  | *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)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | 1. Handling of HTTP redirects at reference point M2d is not specified. [*https://github.com/5G-MAG/Standards/issues/69*](https://github.com/5G-MAG/Standards/issues/69) 2. Definition of ServiceDataFlowDescription type is inconsistent between different clauses. [*https://github.com/5G-MAG/Standards/issues/74*](https://github.com/5G-MAG/Standards/issues/74) 3. PolicyTemplate.applicationSession‌Context redundantly defines properties for Application Service Provider and External Application Identifier when these are already included in parent ProvisioningSession resource. 4. URL format for **Consumption Reporting API** is specified to use the Application Service Provider identifier, which is inconsistent with QoE metrics reporting feature. [*https://github.com/5G-MAG/Standards/issues/73*](https://github.com/5G-MAG/Standards/issues/73) 5. Typo Metrics in table 11.2.3.1-1. [*https://github.com/5G-MAG/Standards/issues/67*](https://github.com/5G-MAG/Standards/issues/67) 6. Specification of **Dynamic Policies API** has minor inconsistencies with the OpenAPI definition. 7. The NetworkAssistance session is not currently tied to a Provisioning Session identifier, so it cannot be audited. Specification of **Network Assistance API** is also poorly structured. 8. Table 7.8.3‑1 defines the QoE metrics reporting scheme as optional (defaulting to urn:3GPP:ns:PSS: DASH:QM10 if omited), but OpenAPI specifies the scheme property as required. [*https://github.com/5G-MAG/Standards/issues/65*](https://github.com/5G-MAG/Standards/issues/65) 9. Procedure for sending consumption report is ambiguous about how server address is selected by the Media Session Handler when more than one endpoint is available. [*https://github.com/5G-MAG/Standards/issues/71*](https://github.com/5G-MAG/Standards/issues/71) 10. Procedures for Network Assistance do not describe the purpose of the MQTT channel. [*https://github.com/5G-MAG/Standards/issues/75*](https://github.com/5G-MAG/Standards/issues/75) 11. Operation to create a Network Assistance Session fails to specify clearly that a request message body is required. [*https://github.com/5G-MAG/Standards/issues/76*](https://github.com/5G-MAG/Standards/issues/76) 12. Semantics of Network Assistance Session properties is ambiguous. [*https://github.com/5G-MAG/Standards/issues/80*](https://github.com/5G-MAG/Standards/issues/80) 13. The sampling interval for QoE metrics is not specified. [*https://github.com/5G-MAG/Standards/issues/78*](https://github.com/5G-MAG/Standards/issues/78) 14. The use of URL filters in relation to QoE metrics is unclear. 15. It is not clear what the metrics reporting behaviour should be when the clientMetricsReportingConfiguration[].‌metrics array is empty in the Service Access Information provided at reference point M5. [*https://github.com/5G-MAG/Standards/issues/68*](https://github.com/5G-MAG/Standards/issues/68) 16. The means by which service operations on the PCF are invoked by the 5GMS AF via the NEF when the AF is deployed outside the Trusted DN does not need to be specified. 17. The way that reference points N5 and N33 are invoked for dynamic policies is not specified. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | 1. Specified handling of HTTP redirects at reference point M2d in clause 8.2 (plus signposting from clause 4.4). 2. Clarified cardinality of properties in ServiceDataFlowDescription in clause 6.4.3.2. 3. Removed redundant aspId and afAppId properties from PolicyTemplate.applicationSession‌Context. 4. Consumption reporting URL format modified to use Provisioning Session identifier instead of Application Service identifier. 5. Fixed typo in table 11.2.3.1-1. 6. Modified textual specification of Dynamic Policies API to match OpenAPI definition. 7. Added Provisioning Session identifier to the NetworkAssistance session resource. Also restructured Network Assistance API specification and made consistent with Dynamic Policies API. 8. Modified Open API at clause C.3.7 to make the scheme property optional. 9. Clarified text at clause 4.7.4 to indicate that server endpoint address for consumption reporting is selected at random. (Also added symmetric text at clause 4.7.5 covering metrics reporting.) 10. Added descriptive text at clause 4.7.6 describing intended usage of MQTT channel endpoint URL. 11. Clarified need for request message body in clause 11.6.4.1 and specified this in the OpenAPI YAML at clause C.4.5. 12. Clarified semantics of dynamicPolicyId and requestedQoS properties in the NetworkAssistanceSession resource type in clause 11.6.4.1. 13. Added samplingPeriod property to M1 MetricsReportingConfiguration (clauses 7.8.3.1 and C.3.7) and M5 ServiceAccessInformation.‌metricsReportingConfigurations[] (clauses 11.2.3.1 and C.4.1). 14. Specified that the Media Entry Point URL is tested against urlFilters in the M1 MetricsReportingConfiguration (clause 7.8.3.1) and M5 ServiceAccessInformation.‌metricsReportingConfigurations[] (clause 11.2.3.1). 15. Clarified that when the clientMetricsReportingConfiguration[].‌metrics array, a default set of metrics is to be reported or (if no default set is specified for the metrics reporting scheme in question) all metrics in that scheme. 16. Removed apiType and apiEndPoint properties from PolicyTemplace resource (clauses 7.9.3.1 and C.3.8) and clarified text at clause 16.2. 17. Added clause 16.3 (based on clause 16.2) describing how N5/N33 are invoked by the 5GMS AF to support dynamic policies. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | 1. 5GMS AS implementations may not correctly handle HTTP redirects received at M2d, resulting in media streaming sessions being diverted away from using the 5GMS AS at M4. 2. Ambiguous implementation of ServiceDataFlowDescription. 3. It is possible to configure a Policy Template for an Application Service Provider and External Application Identifier that is different from that of the parent Provisioning Session, creating an anomaly in the 5GMS System. 4. Consumption reports cannot be reconciled against a particular Provisioning Session. 5. Table 11.2.3.1-1 is inconsistent with OpenAPI definition in clause C.4.1. 6. Dynamic Policies API is ambiguously specified. 7. Usage of Network Assistance cannot be audited against a Provisioning Session. 8. Metrics Reporting Provisioning API is not consistently specified. 9. Danger of too many 5GMS Client selecting the same consumption reporting (or metrics reporting) endpoint and overwhelming the server. 10. Asynchronous notification of changes to throughput estimates is not adequately explained. 11. Implementations of Network Assistance are unable to set initial parameters of the Network Assistance Session. 12. It is unclear what behaviour the 5GMS AF should implement when the dynamicPolicyId and requestedQoS properties are supplied/omitted. 13. It is not possible to signal a limit to the sampling frequency of QoE metrics to the 5GMS Client, which may result in the 5GMS AF being overwhelmed with unnecessarily detailed QoE metrics reports of very large size. 14. It is unclear which URL(s) the Media Session Handler should inspect when determining whether to report QoE metrics for a given media streaming session. 15. Non-deterministic QoE metrics reporting behaviour from different implementations of the 5GMS Client. 16. Different APIs and endpoint addresses can be configured for different Policy Templates under the same Provisioning Session. 17. Lack of standardised behaviour for dynamic policies in different 5GMS AF implementations. | | | | | | | | |
| ***Q*** | |  | | | | | | | | |
| ***Clauses affected:*** | | 4.4, 4.7.4, 4.7.5, 4.7.6, 6.2.1.1, 6.4.3.2, 6.4.3.9, 7.8.3.1, 7.9.3.1, 8.2, 11.2.3.1, 11.3.2, 11.4.2, 11.5.3.1, 11.5.4, 11.6.3.1, 11.6.4, 11.6.4.1 (new) , 11.6.4.2 (new) , 11.6.4.3 (new) , 11.6.4.4 (new) , 11.6.4.5 (new) , 11.6.4.6 (new), 16.2, 16.3 (new), C.2, C.3.7, C.3.8, C.4.1, C.4.2, C.4.4, C.4.5, D | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | |  | | |
| ***affected:*** | |  | **X** | Test specifications | | | |  | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | |  | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | CR0037r1 [S4-231156]:   * Enforced cardinality on ServiceDataFlowDescription in clause C.2. * Moved EndpointAddress and EdgeProcessingEligibilityCriteria data types into correct location in clause C.2. * Added sentence to NOTE in clause 8.2 explaining that the redirect handling mechanism is functionally equivalent to a "reverse mapping rule", the term commonly used by commercial implementations of reverse HTTP proxies. * Added change items 9–17. | | | | | | | | |

FIRST CHANGE

## 4.4 Procedures of the M2d (5GMS content ingest) interface

The following 5GMS AS content ingest protocols are specified by the present document at reference point M2d to support downlink media streaming:

- An *HTTP pull-based content ingest protocol* is specified in clause 8.2, including specific handling for HTTP redirects issued to the 5GMS AS by the 5GMS Application Provider's origin server.

- A *DASH-IF push-based content ingest protocol* is specified in clause 8.3.

NEXT CHANGE

### 4.7.4 Procedures for consumption reporting

These procedures are used by the Media Session Handler and the Consumption Reporting functions of the 5GMSd Client to submit a consumption report via the M5d interface if Consumption Reporting is applied for a downlink streaming session.

The Service Access Information indicating whether Consumption Reporting is provisioned for downlink streaming sessions is described in clause 11.2.3. When the clientConsumptionReportingConfiguration.samplePercentage value is 100, the Media Session Handler shall activate the consumption reporting procedure. If the samplePercentage is less than 100, the Media Session Handler shall generate a random number which is uniformly distributed in the range of 0 to 100, and the Media Session Handler shall activate the consumption report procedure when the generated random number is of a lower value than the samplePercentage value.

If the consumption reporting procedure is activated, the Media Session Handler shall produce and submit a consumption report to the 5GMSd AF when any of the following conditions occur:

- Start of consumption of a downlink streaming session;

- Stop of consumption of a downlink streaming session;

- Upon determining the need to report ongoing 5GMS consumption at periodic intervals determined by the clientConsumptionReportingConfiguration.reportingInterval property.

- Upon determining a location change, if the clientConsumptionReportingConfiguration.locationReporting property is set to True.

- Upon determining an access network change (e.g., unicast to eMBMS, or *vice versa*), if the clientConsumptionReportingConfiguration.accessReporting property is set to True.

Whenever a consumption report is produced, the Media Session Handler shall reset its reporting interval timer to the value of the client‌Consumption‌Reporting‌Configuration.‌reportingInterval property and it shall begin countdown of the timer again. Whenever the Media Session Handler stops the consumption of a downlink streaming session, it shall disable its reporting interval timer.

In order to submit a consumption report, the Media Session Handler shall send an HTTP POST message to the 5GMSd AF. If several 5GMSd AF addresses are listed in the client‌Consumption‌Reporting‌Configuration.‌serverAddresses array (see table 11.2.3.1-1), the Media Session Handler shall choose one at random and shall send the consumption report to the selected server endpoint. The request body shall be a ConsumptionReport structure, as specified in clause 11.3.3.1. The server shall respond with a 200 (OK) message to acknowledge successful processing of the consumption report.

NOTE: If the connection via M5d for consumption reporting is temporarily unavailable, the consumption reports are expected to be stored on the UE for some time until connectivity to the 5GMSd AF is restored and sent later to the 5GMSd AF as a collection. Details are left to implementation.

The Consumption Reporting API, defining the data formats and structures and related procedures for consumption reporting, is described in clause 11.3.

A reporting client identifier shall be included in the consumption report. If available to the Media Session Handler, its value should be a GPSI value as defined by TS 23.003 [7]. Otherwise, the reporting client identifier should be represented by a stable and globally unique string.

NEXT CHANGE

### 4.7.5 Procedures for metrics reporting

The M5 procedures for QoE metrics reporting pertain to the combination of the provisioning of metrics collection and reporting in the Media Session Handler using relevant Service Access Information, and the sending of collected metrics by the Media Session Handler to the 5GMS AF in accordance with the configured metrics scheme(s). A metrics scheme may be 3GPP-defined or non-3GPP-defined.

When the metrics collection and reporting feature is activated for a downlink media streaming session, one or more metrics configuration sets, each associated with a metrics scheme, may be provided to the 5GMS Client. A given metrics configuration set contains information such as the 5GMS AF address(es) to which metrics are to be sent by the Media Session Handler, metrics reporting interval, target percentage of media streaming sessions for which reports should be sent, and the set of metrics to be collected and reported. See TS 26.501 [2] for additional details.

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

Whenever a metrics report is produced for a given metrics configuration, the Media Session Handler shall reset its reporting interval timer for that configuration to the value of the clientMetrics‌Reporting‌Configurations[].‌reportingInterval property and it shall begin countdown of the timer again. Whenever the Media Session Handler stops the consumption of a downlink streaming session, it shall disable its reporting interval timer for all metrics configurations.

In order to submit a metrics report, the Media Session Handler shall send an HTTP POST message to the 5GMS AF. If several 5GMS AF addresses are listed in the clientMetrics‌Reporting‌Configurations[].‌serverAddresses array (see table 11.2.3.1-1), the Media Session Handler shall choose one at random and shall send the metrics report to the selected server endpoint. The request body shall be formatted according to the metrics scheme indicated in clientMetrics‌Reporting‌Configurations[].‌metrics‌Reporting‌ConfigurationId (see table 11.2.3.1-1), as specified in clause 11.4.3. The server shall respond with a 200 (OK) message to acknowledge successful processing of the metrics report.

NOTE: If the connection via M5 for metrics reporting is temporarily unavailable, the metrics reports are expected to be stored on the UE for some time until connectivity to 5GMS AF is restored and sent later to the 5GMS AF as a collection. Details are left to implementation.

Details of the metrics reporting API are provided in clause 11.4, and for 3GP-DASH based downlink media streaming services, the 3GPP-defined metrics reporting scheme and metrics report format are defined in clause 11.4.3.

A reporting client identifier may be included in the metrics report. If available to the Media Session Handler, its value should be a GPSI value as defined by TS 23.003 [7]. Otherwise, the reporting client identifier should be represented by a stable and globally unique string.

NEXT CHANGE

### 4.7.6 Procedures for network assistance

These procedures are used by the 5GMS Client to request Network Assistance from one of the 5GMS AF instances listed in the networkAssistanceConfiguration.serverAddresses property of the Service Access Information resource retrieved using the procedure in clause 4.7.2.3. Details of the APIs supporting these procedures are specified in clause 11.6.

The 5GMS Client first creates a Network Assistance Session with its chosen 5GMS AF instance. It provides information that will later be used by the 5GMS AF to request a particular network QoS to be applied by the PCF to one or more application data flows, and to recommend a bit rate to the 5GMS Client. This procedure is further specified in clause 11.6.4.1.

The NetworkAssistanceSession resource may be retrieved by the Media Session Handler using the procedure specified in clause 11.6.4.2.

When a Network Assistance Session is created, the responding 5GMS AF instance may nominate an MQTT endpoint URL in the NetworkAssistanceSession.notificationURL property. The Media Session Handler may subscribe to the MQTT channel provided at this endpoint and receive notifications with an up-to-date bit rate recommendation whenever this changes.

At any time after the Network Assistance Session resource is created, the 5GMS Client may use the Network Assistance Session identifier to explicitly request a bit rate recommendation by invoking a remote procedure call provided for this purpose by the 5GMS AF. This procedure is further specified in clause 11.6.4.3.

Using the Network Assistance identifier, t by the 5G System at any time by invoking a remote procedure call provided for this purpose by the 5GMS AF This procedure is further specified in clause 11.6.4.4.

The information provided when first creating a Network Assistance Session may be modified subsequently by the Media Session Handler using the session modification procedure specified in clause 11.6.4.5.

In order to terminate a Network Assistance Session, the 5GMS Client deletes the Network Assistance session resource. This procedure is further specified in clause 11.6.4.6.

NEXT CHANGE

#### 6.2.1.1 5GMS AF

Implementations of the 5GMS AF shall expose both HTTP/1.1 [24] and HTTP/2 [31] endpoints at interfaces M1 and M5, including support for the HTTP/2 starting mechanisms specified in section 3 of RFC 7540 [31]. In both protocol versions, TLS [29] shall be supported and HTTPS interactions should be used on these interfaces in preference to cleartext HTTP.

The 5GMS Application Provider may use any supported HTTP protocol version at interface M1.

The Media Session Handler may use any supported HTTP protocol version at interface M5.

All responses from the 5GMS AF that carry a message body shall include a strong entity tag in the form of an ETag response header and a modification timestamp in the form of a Last-Modified response header.

All endpoints shall support the conditional HTTP requests If-None-Match and If-Modified-Since.

NEXT CHANGE

#### 6.4.3.2 ServiceDataFlowDescription type

Table 6.4.3.2-1: Definition of type ServiceDataFlowDescription

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

NEXT CHANGE

#### 6.4.3.9 EndpointAddress type

Table 6.4.3.9-1: Definition of EndpointAddress type

| Property name | Type | Cardinality | Description |
| --- | --- | --- | --- |
| domainName | string | 0..1 | Internet domain name of the endpoint. |
| ipv4Addr | Ipv4Addr | 0..1 | IPv4 address of the endpoint. |
| ipv6Addr | Ipv6Addr | 0..1 | IPv6 address of the endpoint. |
| portNumber | Uinteger | 1 | Port number of the endpoint. |
| NOTE: Either domainName or at least one of ipv4Addr or ipv6Addr shall be present. | | | |

NEXT CHANGE

#### 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* | ResourceId | 1..1 | An identifier for this Metrics Reporting Configuration assigned by the 5GMS AF that is unique within the scope of the enclosing Provisioning Session. |
| *scheme* | Uri | 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 media streaming, if not specified, the 3GPP metrics scheme urn:‌3GPP:‌ns:‌PSS:‌DASH:‌QM10 from TS 26.247 shall apply.  For uplink media streaming, if not specified, the implication is that no associated uplink metrics reporting shall be performed. |
| *dataNetworkName* | Dnn | 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. The value shall be greater than zero.  If not specified, a single final report shall be sent after the media streaming session has ended. |
| *samplePercentage* | Percentage | 0..1 | The proportion of media streaming sessions for which 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 sessions. |
| *urlFilters* | array(String) | 0..1 | A non-empty list of Media Entry Point URL patterns for which metrics shall be reported.  If not specified, reporting shall be done for all media streaming sessions initiated within the scope of the parent Provisioning Session. |
| *samplingPeriod* | DurationSec | 1..1 | The time interval the 5GMS 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 metrics which shall be collected and reported.  In the case of downlink media 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 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 to produce and send metrics reports.  Metrics related to virtual reality media, as specified in TS 26.118 [42] clause 9.3, may also be listed in the metrics configuration, and shall be reported according to the quality reporting scheme defined in clause 9.4 of [42].  In the case of uplink streaming, no standardized metrics nor metrics reporting protocol are defined in the present document. It is assumed that those quality metrics and reporting protocol are defined by the metrics scheme.  If omitted, the complete (or default, as applicable) set of metrics associated with the specified scheme shall be collected and reported. |

NEXT CHANGE

#### 7.9.3.1 PolicyTemplate resource

The data model for the PolicyTemplate resource is specified in table 7.9.3‑1 below:

Table 7.9.3.1-1: Definition of PolicyTemplate resource

| Property | Type | Cardinality | Usage | Description |
| --- | --- | --- | --- | --- |
| policyTemplateId | ResourceId | 1..1 | C: RO R: RO U: RO | Identifier of this Policy Template assigned by the 5GMS AF that is unique within the scope of the Provisioning Session. |
| state | string enum | 1..1 | C: RO R: RO U: RO | A Policy Template may be in the PENDING, INVALID, READY, or SUSPENDED state.  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: – | Additional details about the current state of this Policy Template exposed to the 5GMS Application Provider by the 5GMS AF.  The instance sub-property shall be present and shall indicate the URL of this Policy Template resource.  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: RO U: RW | 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. |
| qoSSpecification | M1‌QoS‌Specification | 0..1 | C: RW R: RO U: RW | Specifies the network quality of service to be applied to media streaming sessions at this Policy Template. |
| application‌Session‌Context | Object | 1..1 |  | Specifies information about the application session context to which this Policy Template can be applied. |
| sliceInfo | Snssai | 0..1 | C: RW R: RW  U: RW | As defined in clause 5.4.4.2 of TS 29.571 [12]. |
| dnn | Dnn | 0..1 | C: RW R: RW  U: RW | As defined in clause 5.3.2 of TS 29.571 [12]. |
| charging‌Specification | Charging‌Specification | 0..1 | C: RW R: RW  U: RW | Provides information about the charging policy to be used for this Policy Template. |

NEXT CHANGE

## 8.2 HTTP pull-based content ingest protocol

If IngestConfiguration.protocol is set to urn:3gpp:5gms:content-protocol:http-pull-ingest in the Content Hosting Configuration, media resources shall be ingested by the 5GMSd AS using HTTP [9]. The IngestConfiguration.pull property shall be set to True, indicating that a Pull-based protocol is used. The IngestConfiguration.baseURL property shall point at the 5GMSd Application Provider's origin server, as specified in table 7.6.3.1‑1, and may indicate the use of HTTPS [16].

When the 5GMSd AS receives a request for a media resource at interface M4d that cannot be satisfied from its content cache, the request shall be transformed into a corresponding HTTP GET request directed to the 5GMSd Application Provider's origin server via interface M2d as follows:

1. The prefix of the request URL indicated in the Distribution‌Configuration.‌baseURL of the applicable Content Hosting Configuration is replaced with that of the corresponding Ingest‌Configuration‌.baseURL.

NOTE 1: It is the responsibility of the 5GMSd AF to assign unique M4d base URLs to each provisioned Content Hosting Configuration so as to ensure that this substitution is unambiguous.

2. The path rewrite rules (if provisioned in DistributionConfiguration.PathRewriteRules) are applied in strict order to the remainder of the request URL (i.e., the path segments following Distribution‌Configuration.‌baseURL). The requestPathPattern of the first matching path rewrite rule is replaced with the corresponding mappedPath.

In the case where the 5GMSd Application Provider's origin server issues an HTTP 3xx redirect at reference point M2d pointing to another location, the 5GMSd AS shall issue an equivalent HTTP redirect to the Media Player via reference point M4d whose location is a dynamically generated M4d endpoint. Requests to this location shall be rewritten by the 5GMSd AS to the target location of the M2d redirection.

NOTE 2: This explicit handling of HTTP redirects received by the 5GMSd AS at reference point M2d ensures that it is not bypassed by the Media Player. The general concept underlying this is commonly referred to as a "reverse mapping rule" by HTTP reverse proxies.

NEXT CHANGE

#### 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 | 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 |  | downlink |
| entryPoints | Array(M5‌Media‌Entry‌Point) | 0..1 | RO | A list of alternative Media Entry Points for the 5GMS 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 this Media Entry Point. |  |
| 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 a document that defines a User Service Announcement for eMBMS where the service announcement file is available. | downlink |
| 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 media streaming session has ended. |
| serverAddresses | array(AbsoluteUrl) | 1..1 | RO | A list of 5GMSd 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 5GMS URL format specified in clause 6.1 up to and including the {apiVersion} path element. |
| 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). |
| accessReporting | boolean | 1..1 | RO | Stipulates whether the Media Session Handler is required to provide consumption reporting messages to the 5GMSd AF when the access network changes during a media streaming session. |
| samplePercentage | Percentage | 1..1 | RO | The percentage of media 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,  uplink |
| serverAddresses | array(AbsoluteUrl) | 1..1 | RO | A list of 5GMSd 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 5GMS URL format specified in clause 6.1 up to and including the {apiVersion} path element. |
| validPolicyTemplateIds | array(ResourceId) | 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 media streaming session.  Example: "HD\_Premium". |
| clientMetricsReporting‌Configurations | array(Object) | 0..1 | RO |  | downlink,  uplink |
| *metricsReporting‌ConfigurationId* | ResourceId | 1..1 | RO | The identifier of this metrics reporting configuration, unique within the scope of provisioningSessionId.  The value shall be the same as the corresponding identifier provisioned at reference point M1. |
| serverAddresses | array(AbsoluteUrl) | 1..1 | RO | A list of 5GMS AF addresses to which metrics reports shall be sent. See NOTE.  Each address shall be an opaque base URL, following the 5GMS URL format specified in clause 6.1 up to and including the {apiVersion} path element. |
| scheme | Uri | 1..1 | RO | A URI identifying the metrics reporting scheme that metrics reports shall use (see clause 4.7.5). |
| 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 streaming sessions that shall report 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 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 media streaming sessions. |
| samplingPeriod | DurationSec | 1..1 | RO | The time interval the 5GMS Client should wait between sampling the QoE metrics specified by this metrics reporting configuration. |
| metrics | array(String) | 1..1 | RO | A list of 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 |  | downlink,  uplink |
| serverAddresses | array(AbsoluteUrl) | 1..1 | RO | A list of 5GMS AF addresses (URLs) that offer the APIs for 5GMS AF-based Network Assistance, for access by the 5GMSd Media Session Handler. See NOTE.  Each address shall be an opaque URL, following the 5GMS URL format specified in clause 6.1 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 |
| eligibilityCriteria | Edge‌Processing‌Eligibility‌Criteria | 0..1 | RO | Conditions for activating edge resources for media streaming sessions in the scope of this Service Access Information. (See clause 6.4.3.8.) |
| easDiscoveryTemplate | EAS‌Discovery‌Template | 1..1 | RO | A template for the EAS discovery filter that shall be used by the EEC to discover and select a 5GMS EAS instance to serve media streaming sessions in the scope of this Service Access Information. (See clause 11.2.3.2.) |
| easRelocation‌Requirements | M5EAS‌Relocation‌Requirements | 0..1 | RO | EAS relocation tolerance and requirements.  If absent, the EEC shall assume that relocation is tolerated by all 5GMS EAS instances in the scope of this Service Access Information. (See clause 11.2.3.3.) |
| NOTE: In deployments where multiple instances of the 5GMSd AF expose the Media Session Handling APIs at 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 AF instance. | | | | | |

NEXT CHANGE

### 11.3.2 Reporting procedure

Consumption reports shall be submitted to a 5GMSd AF endpoint according to the following general URL format:

{apiRoot}/3gpp-m5*/*{apiVersion}*/*consumption-reporting/{provisioningSessionId}

where the first three elements shall be substituted by the 5GMSd Client with one of the base URLs selected from the client‌Consumption‌Reporting‌Configuration.‌serverAddresses array of the ServiceAccessInformation resource (see clause 11.2.3.1) and {provisioningSessionId} shall be substituted with the relevant Provisioning Session identifier obtained from Service Access Information (see clause 11.2.3).

The only HTTP method supported by this endpoint is POST.

NEXT CHANGE

### 11.4.2 Reporting procedure

Metrics reports related to a specific metricsReportingConfigurationId shall be submitted according to the following general format:

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

where the first three elements shall be substituted by the 5GMS Client with one of the base URLs selected from the client‌Metrics‌Reporting‌Configurations.serverAddresses array of the ServiceAccessInformation resource (see clause 11.2.3.1), {provisioning‌Session‌Id} shall be substituted with the relevant Provisioning Session identifier obtained from Service Access Information (see clause 11.2.3) and {metricsReportingConfigurationId} shall be substituted with the relevant Metrics Reporting Configuration identifier.

The only HTTP method supported by this endpoint is POST.

NEXT CHANGE

#### 11.5.3.1 DynamicPolicy resource

The DynamicPolicy resource is specified in table 11.5.3.1-1 below.

Table 11.5.3.1-1: Definition of Dynamic Policy resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Property name | Data type | Cardinality | Usage | Description |
| dynamicPolicyId | ResourceId | 1..1 | RO | Unique identifier for this Dynamic Policy. |
| policyTemplateId | ResourceId | 1..1 | C: RW R: RO U: RW | Identifies the Policy Template which should 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. |
| 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 Provisioning Session, which is linked to the Application Service Provider. |
| qosSpecification | M5‌QoS‌Specification | 0..1 | C: RW R: RO U: RW | Describes the network Quality of Service properties of this Dynamic Policy. |
| enforcementMethod | string | 0..1 | C: RO R: RO U: RO | Description of the Policy Enforcement Method. The parameter is set by the 5GMSd AF. |
| enforcementBitRate | integer | 0..1 | C: RO R: RO U: RO | Description of the enforcement bit rate. |

NEXT CHANGE

### 11.5.4 Operations

This clause defines the behaviour that is expected when activating a Dynamic Policy Instance.

The policyTemplateId property uniquely identifies the Policy Template with which the Dynamic Policy Instance is associated.

The provisioningSessionId property associates the Dynamic Policy Instance with a Provisioning Session.

The Dynamic Policy resource contains a serviceDataFlowDescriptions property which contains a set of service data flow templates according to TS 23.503 [33]. Each service data flow template contains one of:

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

- a domainName.

When the Media Session Handler is attempting to activate a QoS-related Dynamic Policy Template, then the qosSpecification 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.

NEXT CHANGE

#### 11.6.3.1 NetworkAssistanceSession resource

The NetworkAssistanceSession resource is specified in table 11.6.3.1-1 below.

Table 11.6.3.1-1: Definition of NetworkAssistanceSession resource

| Property name | Type | Cardinality | Usage | Description |
| --- | --- | --- | --- | --- |
| naSessionId | ResourceId | 1..1 | C: RO  R: RO  U: RO | Unique identifier for this Network Assistance Session. |
| 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 Provisioning Session, which is linked to the Application Service Provider. |
| serviceDataFlowDescriptions | array(ServiceDataFlowDescription) | 1..1 | C: RW  R: RO  U: RW | IIdentifying one or more application flows for which Network Assistance is sought, e.g. 2-tuple (IP addresses) or 5-tuple (IP Addresses, protocol and ports). |
| mediaType | MediaType | 0..1 | C: RW  R: RO  U: RW | The type of media carried by the application flows listed in service‌DataFlow‌Descriptions. |
| policyTemplateId | ResourceId | 0..1 | C: RW  R: RO  U: RW | Identification of the policy (if any) that is in force for the media streaming session. |
| requestedQoS | M5QoSSpecification | 0..1 | C: RW  R: RO  U: RW | The requested QoS parameters. |
| recommendedQoS | M5QoSSpecification | 0..1 | C: RO  R: RO  U: RO | The QoS parameters currently recommended by the 5GMS AF. |
| notficationURL | AbsoluteUrl | 0..1 | C: RO  R: RO  U: RO | A URL to the MQTT channel over which notifications are to be sent by the 5GMS AF for this session.  When set, the Media Session Handler shall subscribe to this channel. The notification messages shall be in the form of the M5QoSSpecification data type. |

NEXT CHANGE

### 11.6.4 Operations

#### 11.6.4.1 Create Network Assistance session

This clause defines the behaviour that is expected when creating a Network Assistance session.

The Media Session Handler uses the POST HTTP method to create a Network Assistance session with the 5GMS AF. The request includes a NetworkAssistanceSession resource representation in the message body.

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

Media Session HandlersNetworkAssistanceSessionrepresentation in the request PTof the network QoS policy currently in force on(5GMS subsequently )

The serviceDataFlowDescriptions property contains a set of service data flow templates according to TS 23.503 [33]. Each service data flow template contains one of:

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

- a domainName.

The requestedQoS property is used by the Media Session Handler to specify a network QoS it initially wishes to use for the media streaming session. If the policyTemplateId property is also populated in the NetworkAssistanceSession resource, the 5GMS 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 NetworkAssistanceSession resource but the policyTemplateId is populated, the 5GMS 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 5GMS AF within the scope of the Network Assistance session are constrained only by the policies of the PCF.

The 5GMS 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 5GMS AF to refer all subsequent API calls to the 5GMS AF applicable to that Network Assistance session.

#### 11.6.4.2 Retrieve Network Assistance session

The 5GMS Client uses the GET HTTP method with the Network Assistance Session resource identifier to retrieve a Network Assistance Session resource from the 5GMS AF. The 5GMS 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.

#### 11.6.4.3 Request bit rate recommendation

The Media Session Handler uses the GET HTTP 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 media streaming session, the recommended minimum and maximum downlink bit rates shall be indicated in the properties mirBwDlBitRate and marBwDlBitRate respectively. The 5GMSd Client shall ignore the mandatory properties related to uplink streaming, i.e. mirBwUlBitRate and marBwUlBitRate.

- For an uplink media streaming session, the recommended minimum and maximum uplink bit rates shall be indicated in the properties mirBwUlBitRate and marBwUlBitRate, respectively. The 5GMSu Client shall ignore the mandatory properties related to downlink streaming, i.e. mirBwDlBitRate and marBwDlBitRate.

If a unique recommendation is given by the 5GMS 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.

#### 11.6.4.4 Request delivery boost

The Media Session Handler uses the POST HTTP 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.

#### 11.6.4.5 Update Network Assistance session

The Media Session Handler uses the PUT or PATCH HTTP methods to replace the existing steaming session parameters with new settings. For example, any change to the Policy Template currently in force resulting from an invocation of the Dynamic Policies API (see clause 11.5) should also be notified to the 5GMS AF using this operation if a Network Assistance session has been created for the media streaming session in question.

The 5GMS AF returns the NetworkAssistanceSession resource with settings resulting from the PUT or PATCH update operation.

#### 11.6.4.6 Destroy Network Assistance session

The Media Session Handler uses the DELETE HTTP 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).

NEXT CHANGE

## 16.2 Usage of N5/N33 for AF-based Network Assistance

The AF-based Network Assistance feature operates at reference point M5 between the Media Session Handler in the 5GMS Client and a 5GMS AF that provides Network Assistance capabilities. The Network Assistance API at reference point M5 (see clause 11.6) is specified in a generic way such that the associated Network Assistance functionality in the 5GC may be realised by various means.

does not limit

In this release, the 5GMS 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 5GMS 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 5GMS AF shall interact with the PCF using one of the following methods:

A. If the 5GMS 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 [34].

NOTE 1: It is the responsibility of the 5GMS 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 5GMS AF is deployed outside the Trusted DN, or if it is more convenient for a 5GMS AF deployed in the Trusted DN to do so, it invokes the AsSessionWithQoS service exposed by the NEF, as specified in clause 4.4.9 of TS 29.522 [50], to indirectly invoke the PCF at reference point N33.

NOTE 2: Configuration of the NEF endpoint address and access credentials in the 5GMS AF in this case is beyond the scope of the present document.

When a Network Assistance session is created by the Media Session Handler (per clauses 4.7.6 and 11.6.4.1), the 5GMS AF shall create an *AF application session context* in the PCF responsible for the PDU Session corresponding to the M4 application flows listed in the NetworkAssistanceSession.‌serviceDataFlow‌Descriptions property.

5GMS ‌‌‌operation at reference point N5 (or, if deployed outside the Trusted DN, the equivalent AsSession‌WithQoS service operation) ewAF ‌service data flow descriptions in the Network Assistance session resource, as well as from the referenced PT (if any) and/or the requested QoS

The AF application session context shall declaremedia media streaming A separate sub-component shall be declared for each M4 application flow listed in the NetworkAssistanceSession.‌serviceDataFlow‌Descriptions array

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 media streaming session, the 5GMS AF shall use the configured Policy Templates of the Provisioning Session to determine the list of the QoS references within the "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 requested operation point 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 4.7.6 and 11.6.4.6), the 5GMS AF shall destroy the corresponding AF application session context in the relevant PCF instance.

NEXT CHANGE

## 16.3 Usage of N5/N33 for dynamic policies

The dynamic policies feature operates at reference point M5 between the Media Session Handler in the 5GMS Client and a 5GMS AF that has been appropriately provisioned with Policy Templates. The Dynamic Policies API at reference point M5 (see clause 11.5) is specified in a generic way such that the associated functionality in the 5GC may be realised by various means.

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

In this release, the 5GMS 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 5GMS AF shall interact with the PCF using one of the following methods:

A. If the 5GMS 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 [34].

NOTE 1: It is the responsibility of the 5GMS 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 5GMS AF is deployed outside the Trusted DN, or if it is more convenient for a 5GMS AF deployed in the Trusted DN to do so, it invokes the AsSession‌WithQoS and/or Chargeable‌Party services exposed by the NEF, as specified in clauses 4.4.9 and 4.4.8 respectively of TS 29.522 [50], to indirectly invoke the PCF at reference point N33.

NOTE 2: Configuration of the NEF endpoint address and access credentials in the 5GMS AF in this case is beyond the scope of the present document.

When a dynamic policy is instantiated by the Media Session Handler (per clause 4.7.3), the 5GMS AF shall create an *AF application session context* in the PCF responsible for the PDU Session corresponding to the M4 application flows listed in the DynamicPolicy.‌serviceDataFlow‌Descriptions 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 service data flow descriptions in the dynamic policy resource and/or the requested QoS.

The AF application session context shall declare exactly one media component per media streaming session. A separate sub-component shall be declared for each M4 application flow listed in the NetworkAssistanceSession.‌serviceDataFlow‌Descriptions array.

For each of the dynamic policies 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 media streaming session, the 5GMS AF shall use the configured Policy Template of the dynamic policy to determine the list of the QoS references within the "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 requested operation point by the UE (if the UE is allowed to use that operation point).

When a dynamic policy is subsequently destroyed by the Media Session Handler (per clause 4.7.3), the 5GMS AF shall destroy the corresponding AF application session context in the relevant PCF instance.

NEXT CHANGE

# C.2 Data Types applicable to several APIs

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

|  |
| --- |
| openapi: 3.0.0  info:    title: 5GMS Common Data Types    version: 2.0.2    description: |      5GMS Common Data Types  *© 2023*, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).      All rights reserved.  tags:    - name: 5GMS Common Data Types      description: '5G Media Streaming: Common Data Types'  externalDocs:    description: 'TS 26.512 V17.6.0; 5G Media Streaming (5GMS); Protocols'    url: 'https://www.3gpp.org/ftp/Specs/archive/26\_series/26.512/'  paths: {}  components:    schemas:      #################################      # Clause 6.4.2: Simple data types      #################################      ResourceId:        type: string        description: String chosen by the 5GMS AF to serve as an identifier in a resource URI.      Percentage:        type: number        minimum: 0.0        maximum: 100.0      #DurationSec is defined in TS29571\_CommonData      #DateTime is defined in TS29571\_CommonData      #Uri is defined in TS29571\_CommonData      Url:        type: string        format: uri-reference        description: 'Uniform Resource Locator, conforming with the "URI-reference" production specified in IETF RFC 3986, section 4.1.'      RelativeUrl:        type: string        format: uri-reference        description: 'Relative Uniform Resource Locator, conforming with the "relative-ref" production specified in IETF RFC 3986, section 4.2. Note that both "query" and "fragment" suffixes are permitted by this production.'      AbsoluteUrl:        type: string        format: uri        description: 'Absolute Uniform Resource Locator, conforming with the "absolute-URI" production specified in IETF RFC 3986, section 4.3 in which the scheme part is "http" or "https". Note that the "query" suffix is permitted by this production but the "fragment" suffix is not.'        #####################################      # Clause 6.4.3: Structured data types      #####################################      IpPacketFilterSet:        type: object        required:          - direction        properties:          srcIp:            type: string          dstIp:            type: string          protocol:            type: integer          srcPort:            type: integer          dstPort:            type: integer          toSTc:            type: string          flowLabel:            type: integer          spi:            type: integer          direction:            type: string      ServiceDataFlowDescription:        oneOf:          - type: object            required:              - flowDescription            properties:              flowDescription:                $ref: '#/components/schemas/IpPacketFilterSet'          - type: object            required:              - domainName            properties:              domainName:                type: string      M5QoSSpecification:        type: object        required:          - marBwDlBitRate          - marBwUlBitRate          - mirBwDlBitRate          - mirBwUlBitRate        properties:          marBwDlBitRate:            $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'          marBwUlBitRate:            $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'          minDesBwDlBitRate:            $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'          minDesBwUlBitRate:            $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'          mirBwDlBitRate:            $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'          mirBwUlBitRate:            $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'          desLatency:            type: integer            minimum: 0          desLoss:            type: integer            minimum: 0      M1QoSSpecification:        type: object        properties:          qosReference:            type: string          maxBtrUl:            $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'          maxBtrDl:            $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'          maxAuthBtrUl:            $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'          maxAuthBtrDl:            $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'          defPacketLossRateDl:            type: integer            minimum: 0          defPacketLossRateUl:            type: integer            minimum: 0      ChargingSpecification:        type: object        properties:          sponId:            type: string          sponStatus:            $ref: 'TS29514\_Npcf\_PolicyAuthorization.yaml#/components/schemas/SponsoringStatus'          gpsi:            type: array            items:              $ref: 'TS29571\_CommonData.yaml#/components/schemas/Gpsi'      TypedLocation:        type: object        required:          - locationIdentifierType          - location        properties:          locationIdentifierType:            $ref: '#/components/schemas/CellIdentifierType'          location:            type: string      OperationSuccessResponse:        type: object        required:          - success        properties:          success:            type: boolean          reason:            type: string  EndpointAddress:  allOf:  # Host identifier  - oneOf:  # Host name  - type: object  required:  - hostname  properties:  hostname:  type: string  # Host IP address  - anyOf:  - type: object  required:  - ipv4Addr  properties:  ipv4Addr:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv4Addr'  - type: object  required:  - ipv6Addr  properties:  ipv6Addr:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv6Addr'  # Port number  - type: object  required:  - portNumber  properties:  portNumber:  $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uint16'      EdgeProcessingEligibilityCriteria:        type: object        required:          - serviceDataFlowDescriptions          - ueLocations          - timeWindows          - appRequest        properties:          serviceDataFlowDescriptions:            type: array            items:              $ref: '#/components/schemas/ServiceDataFlowDescription'          ueLocations:            type: array            items:              $ref: 'TS29122\_CommonData.yaml#/components/schemas/LocationArea5G'          timeWindows:            type: array            items:              $ref: 'TS29122\_CommonData.yaml#/components/schemas/TimeWindow'          appRequest:            type: boolean      #####################################      # Clause 6.4.4: Enumerated data types      #####################################      CellIdentifierType:        anyOf:          - type: string            enum: [CGI, ECGI, NCGI]          - type: string            description: >              This string provides forward-compatibility with future              extensions to the enumeration but is not used to encode              content defined in the present version of this API.      SdfMethod:        anyOf:          - type: string            enum: [5\_TUPLE, 2\_TUPLE, TYPE\_OF\_SERVICE\_MARKING, FLOW\_LABEL, DOMAIN\_NAME]          - type: string            description: >              This string provides forward-compatibility with future              extensions to the enumeration but is not used to encode              content defined in the present version of this API.      ProvisioningSessionType:        anyOf:          - type: string            enum: [DOWNLINK, UPLINK]          - type: string            description: >              This string provides forward-compatibility with future              extensions to the enumeration but is not used to encode              content defined in the present version of this API.  CacheStatus:  anyOf:  - type: string  enum: [HIT, MISS, EXPIRED]  - type: string  description: >  This string provides forward-compatibility with future  extensions to the enumeration but is not used to encode  content defined in the present version of this API.      EASRelocationTolerance:        anyOf:          - type: string            enum: [RELOCATION\_UNAWARE, RELOCATION\_TOLERANT, RELOCATION\_INTOLERANT]          - type: string            description: >              This string provides forward-compatibility with future              extensions to the enumeration but is not used to encode              content defined in the present version of this API. |

NEXT CHANGE

## C.3.7 M1\_MetricsReportingProvisioning API

|  |
| --- |
| openapi: 3.0.0  info:    title: M1\_MetricsReportingProvisioning    version: 2.1.0    description: |      5GMS AF M1 Metrics Reporting Provisioning API  *© 2023*, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).      All rights reserved.  tags:    - name: M1\_MetricsReportingProvisioning      description: '5G Media Streaming: Provisioning (M1) APIs: Metrics Reporting Provisioning'  externalDocs:    description: 'TS 26.512 V17.6.0; 5G Media Streaming (5GMS); Protocols'    url: 'https://www.3gpp.org/ftp/Specs/archive/26\_series/26.512/'  servers:    - url: '{apiRoot}/3gpp-m1/v2'      variables:        apiRoot:          default: https://example.com          description: See 3GPP TS 29.512 clause 6.1.  paths:    /provisioning-sessions/{provisioningSessionId}/metrics-reporting-configurations:      parameters:        - name: provisioningSessionId          in: path          required: true          schema:            $ref: 'TS26512\_CommonData.yaml#/components/schemas/ResourceId'          description: 'The resource identifier of an existing Provisioning Session.'      post:        operationId: activateMetricsReporting        summary: 'Activate the Metrics reporting procedure for the specified Provisioning Session by providing the Metrics Reporting Configuration'        requestBody:          description: 'A JSON representation of a Metrics Reporting Configuration'          required: true          content:            application/json:              schema:                $ref: '#/components/schemas/MetricsReportingConfiguration'        responses:          '201':            description: 'Metrics Reporting Configuration Created'            headers:              Location:                description: 'URL of the newly created Metrics Reporting Configuration (same as request URL).'                required: true                schema:                  $ref: 'TS26512\_CommonData.yaml#/components/schemas/AbsoluteUrl'    /provisioning-sessions/{provisioningSessionId}/metrics-reporting-configurations/{metricsReportingConfigurationId}:      parameters:        - name: provisioningSessionId          in: path          required: true          schema:            $ref: 'TS26512\_CommonData.yaml#/components/schemas/ResourceId'          description: 'The resource identifier of an existing Provisioning Session.'        - name: metricsReportingConfigurationId          in: path          required: true          schema:            $ref: 'TS26512\_CommonData.yaml#/components/schemas/ResourceId'          description: 'The resource identifier of a Metrics Reporting Configuration.'      get:        operationId: retrieveMetricsReportingConfiguration        summary: 'Retrieve the specified Metrics Reporting Configuration of the specified Provisioning Session'        responses:          '200':            description: 'Success'            content:              application/json:                schema:                  $ref: '#/components/schemas/MetricsReportingConfiguration'      put:        operationId: updateMetricsReportingConfiguration        summary: 'Update the specified Metrics Reporting Configuration for the specified Provisioning Session'        requestBody:          description: 'A JSON representation of a Metrics Reporting Configuration'          required: true          content:            application/json:              schema:                $ref: '#/components/schemas/MetricsReportingConfiguration'        responses:          '204':            description: 'Updated Metrics Reporting Configuration'          '404':            description: 'Not Found'      patch:        operationId: patchMetricsReportingConfiguration        summary: 'Patch the specified Metrics Reporting Configuration for the specified Provisioning Session'        requestBody:          description: 'A JSON representation of a Metrics Reporting Configuration'          required: true          content:            application/merge-patch+json:              schema:                $ref: '#/components/schemas/MetricsReportingConfiguration'            application/json-patch+json:              schema:                $ref: '#/components/schemas/MetricsReportingConfiguration'        responses:          '200':            description: 'Patched Metrics Reporting Configuration'            content:              application/json:                schema:                  $ref: '#/components/schemas/MetricsReportingConfiguration'          '404':            description: 'Not Found'      delete:        operationId: destroyMetricsReportingConfiguration        summary: 'Destroy the specified Metrics Reporting Configuration of the specified Provisioning Session'        responses:          '204':            description: 'Destroyed Metrics Reporting Configuration'          '404':            description: 'Not Found'  components:    schemas:      MetricsReportingConfiguration:        type: object        description: "A representation of a Metrics Reporting Configuration resource."        required:          - metricsReportingConfigurationId          - samplingPeriod        properties:          metricsReportingConfigurationId:            $ref: 'TS26512\_CommonData.yaml#/components/schemas/ResourceId'          scheme:            $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uri'          dataNetworkName:            $ref: 'TS29571\_CommonData.yaml#/components/schemas/Dnn'          reportingInterval:            $ref: 'TS29571\_CommonData.yaml#/components/schemas/DurationSec'          samplePercentage:            $ref: 'TS26512\_CommonData.yaml#/components/schemas/Percentage'          urlFilters:            type: array            items:              type: string            minItems: 1          samplingPeriod:            $ref: 'TS29571\_CommonData.yaml#/components/schemas/DurationSec'          metrics:            type: array            items:              type: string            minItems: 1 |

NEXT CHANGE

## C.3.8 M1\_PolicyTemplatesProvisioning API

|  |
| --- |
| openapi: 3.0.0  info:    title: M1\_PolicyTemplatesProvisioning    version: 2.2.0    description: |      5GMS AF M1 Policy Templates Provisioning API  *© 2023*, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).      All rights reserved.  tags:    - name: M1\_PolicyTemplatesProvisioning      description: '5G Media Streaming: Provisioning (M1) APIs: Policy Templates Provisioning'  externalDocs:    description: 'TS 26.512 V17.6.0; 5G Media Streaming (5GMS); Protocols'    url: 'https://www.3gpp.org/ftp/Specs/archive/26\_series/26.512/'  servers:    - url: '{apiRoot}/3gpp-m1/v2'      variables:        apiRoot:          default: https://example.com          description: See 3GPP TS 29.512 clause 6.1.  paths:    /provisioning-sessions/{provisioningSessionId}/policy-templates:      parameters:        - name: provisioningSessionId          in: path          required: true          schema:            $ref: 'TS26512\_CommonData.yaml#/components/schemas/ResourceId'          description: 'The resource identifier of an existing Provisioning Session.'      post:        operationId: createPolicyTemplate        summary: 'Create (and optionally upload) a new Policy Template'        requestBody:          description: 'A JSON representation of a Policy Template'          required: true          content:            application/json:              schema:                $ref: '#/components/schemas/PolicyTemplate'        responses:          '201':            description: 'Policy Template Created'            headers:              Location:                description: 'URL of the newly created Policy Template resource.'                required: true                schema:                  $ref: 'TS26512\_CommonData.yaml#/components/schemas/AbsoluteUrl'      /provisioning-sessions/{provisioningSessionId}/policy-templates/{policyTemplateId}:      parameters:        - name: provisioningSessionId          in: path          required: true          schema:            $ref: 'TS26512\_CommonData.yaml#/components/schemas/ResourceId'          description: 'A unique identifier of the Provisioning Session.'        - name: policyTemplateId          in: path          required: true          schema:            $ref: 'TS26512\_CommonData.yaml#/components/schemas/ResourceId'          description: 'A resource identifier of a Policy Template.'      get:        operationId: retrievePolicyTemplate        summary: 'Retrieve a representation of an existing Policy Template in the specified Provisioning Session'        responses:          '200':            description: 'Success'            content:              application/json:                schema:                  $ref: '#/components/schemas/PolicyTemplate'          '404':            description: 'Not Found'      put:        operationId: updatePolicyTemplate        summary: 'Update a Policy Template for the specified Provisioning Session'        requestBody:          description: 'A JSON representation of a Policy Template'          required: true          content:            application/json:              schema:                $ref: '#/components/schemas/PolicyTemplate'        responses:          '204':            description: 'Updated Policy Template'          '404':            description: 'Not Found'      patch:        operationId: patchPolicyTemplate        summary: 'Patch the Policy Template for the specified Provisioning Session'        requestBody:          description: 'A JSON representation of a Policy Template'          required: true          content:            application/merge-patch+json:              schema:                $ref: '#/components/schemas/PolicyTemplate'            application/json-patch+json:              schema:                $ref: '#/components/schemas/PolicyTemplate'        responses:          '200':            description: 'Patched Content Hosting Configuration'            content:              application/json:                schema:                  $ref: '#/components/schemas/PolicyTemplate'          '404':            description: 'Not Found'      delete:        operationId: destroyPolicyTemplate        responses:          '204':            description: 'Destroyed Policy Template'          '404':            description: 'Not Found'  components:    schemas:      PolicyTemplate:        type: object        description: "A representation of a Policy Template resource."        required:          - policyTemplateId          - state          - stateReason          - externalReference          - applicationSessionContext        properties:          policyTemplateId:            $ref: 'TS26512\_CommonData.yaml#/components/schemas/ResourceId'          state:            anyOf:            - type: string              enum: [PENDING, INVALID, READY, SUSPENDED]            - type: string              description: >                This string provides forward-compatibility with future                extensions to the enumeration but is not used to encode                content defined in the present version of this API.          stateReason:            $ref: 'TS29571\_CommonData.yaml#/components/schemas/ProblemDetails'          externalReference:            type: string          qoSSpecification:            $ref: 'TS26512\_CommonData.yaml#/components/schemas/M1QoSSpecification'          applicationSessionContext:            type: object            properties:              sliceInfo:                $ref: 'TS29571\_CommonData.yaml#/components/schemas/Snssai'              dnn:                $ref: 'TS29571\_CommonData.yaml#/components/schemas/Dnn'          chargingSpecification:            $ref: 'TS26512\_CommonData.yaml#/components/schemas/ChargingSpecification' |

NEXT CHANGE

## C.4.1 M5\_ServiceAccessInformation API

|  |
| --- |
| openapi: 3.0.0  info:    title: M5\_ServiceAccessInformation    version: 2.3.0    description: |      5GMS AF M5 Service Access Information API  *©* 2023, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).      All rights reserved.  tags:    - name: M5\_ServiceAccessInformation      description: '5G Media Streaming: Media Session Handling (M5) APIs: Service Access Information'  externalDocs:    description: 'TS 26.512 V17.6.0; 5G Media Streaming (5GMS); Protocols'    url: 'https://www.3gpp.org/ftp/Specs/archive/26\_series/26.512/'  servers:    - url: '{apiRoot}/3gpp-m5/v2'      variables:        apiRoot:          default: https://example.com          description: See 3GPP TS 29.512 clause 6.1.  paths:    /service-access-information/{provisioningSessionId}:      parameters:        - name: provisioningSessionId          description: 'The resource identifier of an existing Provisioning Session.'          in: path          required: true          schema:            $ref: 'TS26512\_CommonData.yaml#/components/schemas/ResourceId'      get:        operationId: retrieveServiceAccessInformation        summary: 'Retrieve the Service Access Information resource'        responses:          '200':            description: 'Success'            content:              application/json:                schema:                    $ref: '#/components/schemas/ServiceAccessInformationResource'          '404':            description: 'Not Found'  components:    schemas:      M5MediaEntryPoint:        description: "A typed entry point for downlink or uplink media streaming."        type: object        required:          - locator          - contentType        properties:          locator:            $ref: 'TS26512\_CommonData.yaml#/components/schemas/AbsoluteUrl'          contentType:            type: string          profiles:            type: array            items:              $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uri'            minItems: 1      ServerAddresses:        description: "A set of application endpoint addresses."        type: array        items:          $ref: 'TS26512\_CommonData.yaml#/components/schemas/AbsoluteUrl'        minItems: 1      ServiceAccessInformationResource:        description: "A representation of a Service Access Information resource."        type: object        required:        - provisioningSessionId        - provisioningSessionType        properties:          provisioningSessionId:            $ref: 'TS26512\_CommonData.yaml#/components/schemas/ResourceId'          provisioningSessionType:            $ref: 'TS26512\_CommonData.yaml#/components/schemas/ProvisioningSessionType'          streamingAccess:            type: object            properties:              entryPoints:                type: array                items:                  $ref: '#/components/schemas/M5MediaEntryPoint'              eMBMSServiceAnnouncementLocator:                $ref: 'TS26512\_CommonData.yaml#/components/schemas/AbsoluteUrl'          clientConsumptionReportingConfiguration:            type: object            required:              - serverAddresses              - locationReporting              - samplePercentage            properties:              reportingInterval:                $ref: 'TS29571\_CommonData.yaml#/components/schemas/DurationSec'              serverAddresses:                $ref: '#/components/schemas/ServerAddresses'              locationReporting:                type: boolean              accessReporting:                type: boolean              samplePercentage:                $ref: 'TS26512\_CommonData.yaml#/components/schemas/Percentage'          dynamicPolicyInvocationConfiguration:            type: object            required:              - serverAddresses              - validPolicyTemplateIds              - sdfMethods            properties:              serverAddresses:                $ref: '#/components/schemas/ServerAddresses'              validPolicyTemplateIds:                type: array                items:                  $ref: 'TS26512\_CommonData.yaml#/components/schemas/ResourceId'                minItems: 0              sdfMethods:                type: array                items:                  $ref: 'TS26512\_CommonData.yaml#/components/schemas/SdfMethod'                minItems: 0              externalReferences:                type: array                items:                  type: string                minItems: 1          clientMetricsReportingConfiguration:            type: array            items:              type: object              required:              - serverAddresses              - scheme              - samplePercentage              - urlFilters              - samplingPeriod              - metrics              properties:                serverAddresses:                  $ref: '#/components/schemas/ServerAddresses'                scheme:                  $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uri'                dataNetworkName:                  $ref: 'TS29571\_CommonData.yaml#/components/schemas/Dnn'                reportingInterval:                  $ref: 'TS29571\_CommonData.yaml#/components/schemas/DurationSec'                samplePercentage:                  $ref: 'TS26512\_CommonData.yaml#/components/schemas/Percentage'                urlFilters:                  type: array                  items:                    type: string                  minItems: 0                samplingPeriod:                  $ref: 'TS29571\_CommonData.yaml#/components/schemas/DurationSec'                metrics:                  type: array                  items:                    type: string          networkAssistanceConfiguration:            type: object            required:              - serverAddresses            properties:              serverAddresses:                $ref: '#/components/schemas/ServerAddresses'  clientEdgeResourcesConfiguration:            type: object            required:              - easDiscoveryTemplate            properties:              eligibilityCriteria:                $ref: 'TS26512\_CommonData.yaml#/components/schemas/EdgeProcessingEligibilityCriteria'              easDiscoveryTemplate:                $ref: '#/components/schemas/EASDiscoveryTemplate'              easRelocationRequirements:                $ref: '#/components/schemas/M5EASRelocationRequirements'      M5EASRelocationRequirements:        description: 'Relocation requirements of an EAS.'        type: object        required:          - tolerance        properties:          tolerance:            $ref: 'TS26512\_CommonData.yaml#/components/schemas/EASRelocationTolerance'          maxInterruptionDuration:            $ref: 'TS29571\_CommonData.yaml#/components/schemas/UintegerRm'      EASDiscoveryTemplate:        description: 'A template for discovering an EAS instance .'        type: object        required:          - easType          - easProviderIds          - serviceFeatures        properties:          easType:            type: string          easProviderIds:            type: array            items:              type: string          serviceFeatures:            type: array            items:              type: string |

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## C.4.2 M5\_ConsumptionReporting API

|  |
| --- |
| openapi: 3.0.0  info:    title: M5\_ConsumptionReporting    version: 2.1.0    description: |      5GMS AF M5 Consumption Reporting API  *©* 2023, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).      All rights reserved.  tags:    - name: M5\_ConsumptionReporting      description: '5G Media Streaming: Media Session Handling (M5) APIs: Consumption Reporting'  externalDocs:    description: 'TS 26.512 V17.6.0; 5G Media Streaming (5GMS); Protocols'    url: 'https://www.3gpp.org/ftp/Specs/archive/26\_series/26.512/'  servers:    - url: '{apiRoot}/3gpp-m5/v2'      variables:        apiRoot:          default: https://example.com          description: See 3GPP TS 29.512 clause 6.1.  paths:    /consumption-reporting/{provisioningSessionId}:      parameters:        - name: aspId          in: path          required: true          schema:            $ref: 'TS29514\_Npcf\_PolicyAuthorization.yaml#/components/schemas/AspId'          description: 'See 3GPP TS 26.512 clause 11.3.2.'      post:        operationId: submitConsumptionReport        summary: 'Submit a Consumption Report'        requestBody:          description: 'A Consumption Report'          required: true          content:            application/json:              schema:                $ref: '#/components/schemas/ConsumptionReport'        responses:          '204':            description: 'Consumption Report Accepted'          '400':            description: 'Bad Request'          '415':            description: 'Unsupported Media Type'  components:    schemas:      ConsumptionReport:        description: "A representation of a Consumption Report."        type: object        required:          - mediaPlayerEntry          - reportingClientId          - consumptionReportingUnits        properties:          mediaPlayerEntry:            type: string          reportingClientId:            type: string          consumptionReportingUnits:            type: array            items:              $ref: '#/components/schemas/ConsumptionReportingUnit'      ConsumptionReportingUnit:        description: "A Consumption Reporting Unit."        type: object        required:          - mediaConsumed          - startTime          - duration        properties:          mediaConsumed:            type: string          mediaEndpointAddress:            $ref: 'TS26512\_CommonData.yaml#/components/schemas/EndpointAddress'          startTime:            $ref: 'TS29571\_CommonData.yaml#/components/schemas/DateTime'          duration:            $ref: 'TS29571\_CommonData.yaml#/components/schemas/DurationSec'          locations:            type: array            items:              $ref: 'TS26512\_CommonData.yaml#/components/schemas/TypedLocation'            minItems: 1 |

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## C.4.4 M5\_DynamicPolicies API

|  |
| --- |
| openapi: 3.0.0  info:    title: M5\_DynamicPolicies    version: 2.0.2    description: |      5GMS AF M5 Dynamic Policy API  *© 2023*, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).      All rights reserved.  tags:    - name: M5\_DynamicPolicies      description: '5G Media Streaming: Media Session Handling (M5) APIs: Dynamic Policies'  externalDocs:    description: 'TS 26.512 V17.6.0; 5G Media Streaming (5GMS); Protocols'    url: 'https://www.3gpp.org/ftp/Specs/archive/26\_series/26.512/'  servers:    - url: '{apiRoot}/3gpp-m5/v2'      variables:        apiRoot:          default: https://example.com          description: See 3GPP TS 29.512 clause 6.1.  paths:    /dynamic-policies:      post:        operationId: createDynamicPolicy        summary: 'Create (and optionally upload) a new Dynamic Policy resource'        requestBody:          description: 'An optional JSON representation of a Dynamic Policy resource'          content:            application/json:              schema:                $ref: '#/components/schemas/DynamicPolicy'        responses:          '201':            description: 'Created Dynamic Policy Resource'            content:              application/json:                schema:                  $ref: '#/components/schemas/DynamicPolicy'            headers:              Location:                description: 'The URL of the newly created Dynamic Policy resource'                required: true                schema:                  $ref: 'TS26512\_CommonData.yaml#/components/schemas/AbsoluteUrl'          '400':            description: 'Bad Request'          '401':            description: 'Unauthorized'      /dynamic-policies/{dynamicPolicyId}:      parameters:        - name: dynamicPolicyId          description: 'The resource identifier of a Dynamic Policy resource'          in: path          required: true          schema:            $ref: 'TS26512\_CommonData.yaml#/components/schemas/ResourceId'      get:        operationId: retrieveDynamicPolicy        summary: 'Retrieve an existing Dynamic Policy resource'        responses:          '200':            description: 'Success'            content:              application/json:                schema:                  $ref: '#/components/schemas/DynamicPolicy'          '400':            description: 'Bad Request'          '401':            description: 'Unauthorized'          '404':            description: 'Not Found'      put:        operationId: updateDynamicPolicy        summary: 'Update an existing Dynamic Policy resource'        requestBody:          description: 'A replacement JSON representation of a Dynamic Policy resource'          required: true          content:            application/json:              schema:                $ref: '#/components/schemas/DynamicPolicy'        responses:          '400':            description: 'Bad Request'          '401':            description: 'Unauthorized'          '404':            description: 'Not found'      patch:        operationId: patchDynamicPolicy        summary: 'Patch an existing Dynamic Policy resource'        requestBody:          description: 'A JSON patch to a Dynamic Policy resource'          required: true          content:            application/merge-patch+json:              schema:                $ref: '#/components/schemas/DynamicPolicy'            application/json-patch+json:              schema:                $ref: '#/components/schemas/DynamicPolicy'        responses:          '200':            description: 'Patched Dynamic Policy'            content:              application/json:                schema:                  $ref: '#/components/schemas/DynamicPolicy'          '204':            description: 'Patched Dynamic Policy'          '400':            description: 'Bad Request'          '401':            description: 'Unauthorized'          '404':            description: 'Not found'      delete:        operationId: destroyDynamicPolicy        summary: 'Destroy an existing Dynamic Policy resource'        responses:          '204':            description: 'Destroyed Dynamic Policy'          '400':            description: 'Bad Request'          '401':            description: 'Unauthorized'          '404':            description: 'Not Found'  components:    schemas:      DynamicPolicy:        description: "A representation of a Dynamic Policy resource."        type: object        required:          - dynamicPolicyId          - policyTemplateId          - serviceDataFlowDescriptions          - provisioningSessionId        properties:          dynamicPolicyId:            $ref: 'TS26512\_CommonData.yaml#/components/schemas/ResourceId'          policyTemplateId:            $ref: 'TS26512\_CommonData.yaml#/components/schemas/ResourceId'          serviceDataFlowDescriptions:            type: array            items:              $ref: 'TS26512\_CommonData.yaml#/components/schemas/ServiceDataFlowDescription'          mediaType:            $ref: 'TS29514\_Npcf\_PolicyAuthorization.yaml#/components/schemas/MediaType'          provisioningSessionId:            $ref: 'TS26512\_CommonData.yaml#/components/schemas/ResourceId'          qosSpecification:            $ref: 'TS26512\_CommonData.yaml#/components/schemas/M5QoSSpecification'          enforcementMethod:            type: string          enforcementBitRate:            type: integer |

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## C.4.5 M5\_NetworkAssistance API

|  |
| --- |
| openapi: 3.0.0  info:    title: M5\_NetworkAssistance    version: 2.1.0    description: |      5GMS AF M5 Network Assistance API  *© 2023*, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).      All rights reserved.  tags:    - name: M5\_NetworkAssistance      description: '5G Media Streaming: Media Session Handling (M5) APIs: Network Assistance'  externalDocs:    description: 'TS 26.512 V17.6.0; 5G Media Streaming (5GMS); Protocols'    url: 'https://www.3gpp.org/ftp/Specs/archive/26\_series/26.512/'  servers:    - url: '{apiRoot}/3gpp-m5/v2'      variables:        apiRoot:          default: https://example.com          description: apiRoot as defined in subclause 4.4.1 of 3GPP TS 29.501.  paths:    /network-assistance/:      post:        operationId: createNetworkAssistanceSession        summary: 'Create a new Network Assistance Session.'        requestBody:          description: 'The initial parameters for the Network Assistance Session resource'          content:            application/json:              schema:                $ref: '#/components/schemas/NetworkAssistanceSession'        responses:          '201':            description: 'Created Network Assistance Session'            content:              application/json:                schema:                  $ref: '#/components/schemas/NetworkAssistanceSession'            headers:              Location:                description: 'The URL of the newly created Network Assistance Session resource'                required: true                schema:                  $ref: 'TS26512\_CommonData.yaml#/components/schemas/AbsoluteUrl'          '400':            description: 'Bad Request'          '401':            description: 'Unauthorized'    /network-assistance/{naSessionId}:      parameters:        - name: naSessionId          description: 'The resource identifier of an existing Network Assistance Session resource'          in: path          required: true          schema:            $ref: 'TS26512\_CommonData.yaml#/components/schemas/ResourceId'      get:        operationId: retrieveNetworkAssistanceSession        summary: 'Retrieve an existing Network Assistance Session resource'        responses:          '200':            description: 'A JSON representation of a Network Assistance Session resource'            content:              application/json:                schema:                    $ref: '#/components/schemas/NetworkAssistanceSession'          '400':            description: 'Bad Request'          '401':            description: 'Unauthorized'          '404':            description: 'Not Found'      put:        operationId: updateNetworkAssistanceSession        summary: 'Update an existing Network Assistance Session resource'        requestBody:          description: 'A replacement JSON representation of a Network Assistance Session resource'          required: true          content:            application/json:              schema:                $ref: '#/components/schemas/NetworkAssistanceSession'        responses:          '400':            description: 'Bad Request'          '401':            description: 'Unauthorized'          '404':            description: 'Not found'      patch:        operationId: patchNetworkAssistanceSession        summary: 'Patch an existing Network Assistance Session resource'        requestBody:          description: 'A JSON patch to a Network Assistance Session resource'          required: true          content:            application/merge-patch+json:              schema:                $ref: '#/components/schemas/NetworkAssistanceSession'            application/json-patch+json:              schema:                $ref: '#/components/schemas/NetworkAssistanceSession'        responses:          '200':            description: 'Patched Network Assistance Session'            content:              application/json:                schema:                    $ref: '#/components/schemas/NetworkAssistanceSession'          '204':            description: 'Patched Network Assistance Session'          '400':            description: 'Bad Request'          '401':            description: 'Unauthorized'          '404':            description: 'Not Found'      delete:        operationId: destroyNetworkAssistanceSession        summary: 'Destroy an existing Network Assistance Session resource'        responses:          '204':            description: 'Destroyed Network Assistance Session'          '400':            description: 'Bad Request'          '401':            description: 'Unauthorized'          '404':            description: 'Not Found'    /network-assistance/{naSessionId}/recommendation:      get:        operationId: requestBitRateRecommendation        summary: 'Obtain a bit rate recommendation for the next recommendation window'        parameters:          - name: naSessionId            description: 'The resource identifier of an existing Network Assistance Session resource'            in: path            required: true            schema:              type: string        responses:          '200':            description: 'Success'            content:              application/json:                schema:                    $ref: 'TS26512\_CommonData.yaml#/components/schemas/M5QoSSpecification'          '400':            description: 'Bad Request'          '401':            description: 'Unauthorized'          '404':            description: 'Not Found'    /network-assistance/{naSessionId}/boost-request:      post:        operationId: requestDeliveryBoost        summary: 'Request a delivery boost'        parameters:          - name: naSessionId            description: 'The resource identifier of an existing Network Assistance Session resource'            in: path            required: true            schema:              type: string        responses:          '200':            description: 'Delivery Boost Request Processed'            content:              application/json:                schema:                    $ref: 'TS26512\_CommonData.yaml#/components/schemas/OperationSuccessResponse'          '400':            description: 'Bad Request'          '401':            description: 'Unauthorized'          '404':            description: 'Not Found'  components:    schemas:      NetworkAssistanceSession:        description: "A representation of a Network Assistance Session resource."        type: object        required:          - naSessionId          - provisioningSessionId          - serviceDataFlowDescriptions        properties:          naSessionId:            $ref: 'TS26512\_CommonData.yaml#/components/schemas/ResourceId'          provisioningSessionId:            $ref: 'TS26512\_CommonData.yaml#/components/schemas/ResourceId'          serviceDataFlowDescriptions:            type: array            items:              $ref: 'TS26512\_CommonData.yaml#/components/schemas/ServiceDataFlowDescription'            minItems: 1          mediaType:            $ref: 'TS29514\_Npcf\_PolicyAuthorization.yaml#/components/schemas/MediaType'          policyTemplateId:            $ref: 'TS26512\_CommonData.yaml#/components/schemas/ResourceId'          requestedQoS:            $ref: 'TS26512\_CommonData.yaml#/components/schemas/M5QoSSpecification'          recommendedQoS:            $ref: 'TS26512\_CommonData.yaml#/components/schemas/M5QoSSpecification'          notficationURL:            $ref: 'TS26512\_CommonData.yaml#/components/schemas/AbsoluteUrl' |

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Annex D (informative):  
5GMS AF API index

Table D-1: Index of Provisioning (M1) 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 |  |  |  |  | 7.2.2 | C.3.1 |
| {provisioningSessionId} | Provisioning Session resource |  | GET |  | DELETE |  |
| certificates | Server Certificates collection | POST |  |  |  |  | 7.3.2 | C.3.2 |
| {certificateId} | Server Certificate resource |  | GET | PUT | DELETE |  |
| content-preparation-templates | Content Preparation Templates collection | POST |  |  |  |  | 7.4.2 | C.3.3 |
| {contentPreparationTemplateId} | Content Preparation Template resource |  | GET | PUT, PATCH | DELETE |  |
| content-protocols-discovery | Content Protocols resource |  | GET |  |  |  | 7.5.2 | C.3.4 |
| content-hosting-configuration | Content Hosting Configuration resource | POST | GET | PUT, PATCH | DELETE |  | 7.6.2 | C.3.5 |
| purge | Content Hosting cache purge operation |  |  |  |  | POST |
| consumption-reporting-configuration | Consumption Reporting Configuration resource | POST | GET | PUT, PATCH | DELETE |  | 7.7.2 | C.3.6 |
| metrics-reporting-configuration | Metrics Reporting Configuration collection | POST |  |  |  |  | 7.8.2 | C.3.7 |
| {metricsReportingConfigurationId} | Metrics Reporting Configuration resource |  | GET | PUT, PATCH | DELETE |  |
| policy-templates | Policy Templates collection | POST |  |  |  |  | 7.9.2 | C.3.8 |
| {policyTemplateId} | Policy Template resource |  | GET | PUT, PATCH | DELETE |  |
| edge-resources-configurations | Edge Resources Configurations collection | POST |  |  |  |  | 7.10.2 | C.3.9 |
| {edgeResourcesConfigurationId} | Edge Resources Configuration resource |  | GET | PUT, PATCH | DELETE |  |
| event-data-processing-configurations | Event Data Processing Configuration collection | POST |  |  |  |  | 7.11.2 | C.3.10 |
| {event‌Data‌Processing‌ConfigurationId} | Event Data Processing Configuration resource |  | GET | PUT, PATCH | DELETE |  |

Table D‑2: Index of Media Session Handling (M5) APIs

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| HTTP request path element hierarchy | Description | Allowed HTTP methods | | | | | Resource | OpenAPI |
| Create | Retrieve | Update | Destroy | Non-RESTful operation | structure definition clause | definition clause |
| service-access-information | Service Access Information collection |  |  |  |  |  | 11.2.2 | C.4.1 |
| {provisioningSessionId} | Service Access Information resource |  | GET |  |  |  |
| consumption-reporting | Consumption Reporting collection |  |  |  |  |  | 11.3.2 | C.4.2 |
| {provisioningSessionId} | Consumption Reporting operation |  |  |  |  | POST |
| metrics-reporting | Metrics Reporting collection |  |  |  |  |  | 11.4.2 | C.4.3 |
| {provisioningSessionId} | Metrics Reporting Configurations collection |  |  |  |  |  |
| {metricsReportingConfgurationId} | Metrics Reporting operation |  |  |  |  | POST |
| dynamic-policies | Dynamic Policies collection | POST |  |  |  |  | 11.5.2 | C.4.4 |
| {dynamicPolicyId} | Dynamic Policy resource |  | GET | PUT, PATCH | DELETE |  |
| network-assistance | Network Assistance Sessions collection | POST |  |  |  |  | 11.6.2 | C.4.5 |
| {naSessionId} | Network Assistance Session resource |  | GET | PUT, PATCH | DELETE |  |
| recommendation | Bit rate recommendation request operation |  |  |  |  | GET |
| boostRequest | Delivery boost request operation |  |  |  |  | POST |

END OF CHANGES