**3GPP TSG-S4 Meeting #122 *S4-230041***

**Athens, Greece, 20th–24th February 2023**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  | **26.512** | **CR** | **0031** | **rev** |  | **Current version:** | **16.8.0** |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network | **X** |

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| ***Title:***  |  |
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| ***Source to WG:*** | BBC |
| ***Source to TSG:*** | S4 |
|  |  |
| ***Work item code:*** | 5GMS3 |  | ***Date:*** | 2023-02-09 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | Rel-16 |
|  |  |
| ***Reason for change:*** | A number of errros and omissions have come to light during implementation of this specification in the 5G-MAG Reference Tools initiative.. |
|  |  |
| ***Summary of change:*** | * Allowance of multiple alternative 5GMS AF server endpoint addresses for Network Assistance, in line with Consumption Reporting and Dynamic Policy client configuration.
* Added missing error response for cache purging operation when the supplied regular expression is invalid.
* Add missing notifications and errors for AF-based Network Assistance to Media Session Handling API.
* Fix Service Operation Point definitions for Media Stream Handling API.
* Tighten up specification of absolute URLs versus relative URLs in OpenAPI definitions.
* Fix broken OpenAPI definition for cache purging operation.
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|  |  |
| ***Consequences if not approved:*** | * AF-based Network Assistance feature in not scalable in deployment.
* 5GMS-Aware Application is not notified of events and errors in AF-based Network Assistance.
* Automated selection of Dynamic Policy by Media Session Handler is not supported by client APIs.
* Cache purge operation cannot specify a regular expression.
 |
| ***Q*** |  |
| ***Clauses affected:*** | 4.7.2.3, 4.7.4, 4.7.6, 6.2.2, 6.2.3.3, 7.6.3.1, 7.6.4.3, 7.9.1, 7.9.3.1, 11.2.3.1, 11.3.3.1, 11.6.3.1, 12.2, 13.2.5, 13.2.6, C |
|  |  |
|  | **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:*** |  |

FIRST CHANGE

#### 4.7.2.3 Retrieve Service Access Information properties

(SNIPPED: NO FURTHER CHANGES TO THIS CLAUSE)

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 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, if the clientConsumptionReportingConfiguration.accessReporting property is set to True.

Whenever a consumption report is sent, the Media Session Handler shall reset its reporting interval timer to the value of the 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 and send the message to the selected. 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.

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

### 4.7.6 Procedures for network assistance

This procedure is 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.

The 5GMS Client first creates a Network Assistance Session with its chosen 5GMS AF instance. It provides information that will be used by the Network Assistance function to request QoS from the PCF and to recommend a bit rate to the 5GMS Client.

The 5GMS Client may also request a delivery boost to be provided.

After the Network Assistance Session resource is provisioned, the 5GMS Client uses the Network Assistance Session identifier when requesting a bit rate recommendation.

In order to terminate a Network Assistance Session, the 5GMS Client deletes the Network Assistance session resource.

NEXT CHANGE

### 6.2.2 HTTP message bodies for API resources

The OpenAPI [23] specification of HTTP messages and their content bodies is contained in annex C.

NEXT CHANGE

#### 6.2.3.3 Server identification

##### 6.2.3.3.1 5GMS AF identification

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

5GMSAF-{FQDN}/{complianceInformation}

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

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

EXAMPLE 1: 5GMSAF-vm10664.mno.net/16.9.0 (api=1.1.0) libsbi/2.1 libnf/1.2 libaf/1.1

EXAMPLE 2: 5GMSAF-vm10664.mno.net/16 (api=1.1.0) libsbi/2.1 libnf/1.2 libaf/1.1

NEXT CHANGE

#### 7.6.3.1 ContentHostingConfiguration resource

The data model for the ContentHostingConfiguration resource is specified in table 7.6.3.1-1 below:

Table 7.6.3.1-1: Definition of ContentHostingConfiguration resource

| Property name | Data Type | Cardinality | Description |
| --- | --- | --- | --- |
| name | String | 1..1 | A name for this Content Hosting Configuration. |
| entryPointPath | RelativeUrl | 0..1 | An entry point for a single content item expressed as a relative path (i.e. without a scheme or any leading forward slash characters). The semantics of the entry point are dependent on the value of ingestConfiguration.protocol, as specified in clause 8.If provided, the path shall be valid at reference point M2d when appended to the ingest base URL and at reference point M4d when appended to all distribution base URLs. |
| ingestConfiguration | Object | 1..1 | Describes the 5GMSd Application Provider's origin server from which media resources will be ingested via interface M2d. |
|  pull | Boolean | 1..1 | Indicates whether to the 5GMSd AS shall use Pull or Push for ingesting the content. |
|  protocol | Uri | 1..1 | A fully-qualified term identifier allocated in the name space urn:3gpp:5gms:content-protocol that identifies the content ingest protocol.The set of supported protocols is defined in clause 8. |
|  baseURL | AbsoluteUrl | 0..1 | A base URL (i.e. one that includes a scheme, authority and, optionally, path segments) from which content is ingested at reference point M2d for this ingest configuration.In the case of Pull-based content ingest (pull flag is set to True), the base URL shall be provided to the 5GMSd AF to indicate the location from which content is to be pulled for this Content Hosting Configuration. A request received at reference point M4d is mapped by the 5GMSd AS to a URL at reference point M2d whose base is the value of this property.In the case of Push-based content ingest (pull flag is set to False), this property is populated by the 5GMSd AF and returned to the 5GMSd Application Provider to indicate the base URL to which content for this Content Hosting Configuration is to be published. |
| distributionConfigurations | Array(Object) | 1..1 | Specifies the distribution method and configuration for the ingested content.More than one distribution may be configured for the ingested content, e.g. to offer different distribution configurations such as DASH and HLS. |
|  contentPreparationTemplateId | ResourceId | 0..1 | Indicates that content preparation prior to distribution is requested by the 5GMSd Application Provider. It identifies the Content Preparation Template that shall be used as defined in clause 7.4. |
|  supplementary‌Distribution‌Networks | Array(<Distribution‌NetworkType, DistributionMode> | 0..1 | Specifies that the content for this distribution configuration is to be distributed via one of more supplementary networks. Each member of the array is a duple mapping a type of distribution network to a mode of distribution.The same DistributionNetworkType value shall appear at most once in the array. |
|  canonicalDomainName | String | 0..1 | All resources of the current distribution shall be accessible through this default Fully Qualified Domain Name assigned by the 5GMSd AF. |
|  domainNameAlias | String | 0..1 | The 5GMSd Application Provider may assign another Fully-Qualified Domain Name through which media resources are additionally accessible at M4d.This domain name is used by the 5GMSd AS to select an appropriate Server Certificate to present at M4d, and to set appropriate CORS HTTP response headers at M4d.If this property is present, the 5GMSd Application Provider is responsible for providing in the DNS a CNAME record that resolves domainNameAlias to canonicalDomainName. |
|  baseURL | AbsoluteUrl | 0..1 | A base URL (i.e. one that includes a scheme, authority and, optionally, path segments) from which content is made available to 5GMS Clients at reference point M4d for this distribution configuration.The value is chosen by the 5GMSd AF when the Content Hosting Configuration is provisioned. It is an error for the 5GMSd Application Provider to set this. |
|  pathRewriteRules | Array(Object) | 0..1 | An ordered list of rules for rewriting the request URL paths of media resource requests handled by the 5GMSd AS.If multiple rules match a particular resource's path, only the first matching rule, in order of appearance in this array, shall be applied. |
|  requestPathPattern | String | 1..1 | A regular expression [5] against which the path part of each 5GMSd AS request URL, including the leading "/", and up to and including the final "/", shall be compared. (Any leaf path element following the final "/" shall be excluded from this comparison.)In the case of Pull-based ingest, the M4d download request path is used in the comparison.In the case of Push-based ingest, the M2d upload request path is used in the comparison.In either case, if the request path matches this pattern, the path mapping specified in the corresponding mappedPath shall be applied. |
|  mappedPath | String | 1..1 | A replacement for the portion of the 5GMSd AS request path that matches requestPathPattern.In the case of Pull-based ingest, ingestConfiguration.entryPoint is concatenated with the mapped path and any leaf path element from the original M4d download request to form the M2d origin request URL.In the case of Push-based ingest, canonicalDomainName (and, optionally, domainNameAlias) are concatenated with the mapped path and any leaf path element from the original M2d upload request to form the distribution URL(s) exposed over M4d. |
|  cachingConfigurations | Array(Object) | 0..1 | Defines a configuration of the 5GMSd AS cache for a matching subset of media resources ingested in relation to this Content Hosting Configuration. |
|  urlPatternFilter | String | 1..1 | A pattern that will be used to match media resource URLs to determine whether a given media resource is eligible for caching by the 5GMSd AS. The format of the pattern shall be a regular expression as specified in [5]. |
|  cachingDirectives | Object | 1..1 | If a urlPatternFilter applies to a resource, then the provided cachingDirectives shall be applied by the 5GMSd AS at M4d, potentially overwriting any origin caching directives ingested at M2d. |
|  statusCodeFilters | Array(Integer) | 0..1 | The set of HTTP origin response status codes to which these cachingDirectives apply. The filter shall be provided as a regular expression as specified in [5].If the list is empty, the CachingDirectives shall apply to all HTTP origin response status codes at M2d. |
|  noCache | Boolean | 1..1 | If set to True, this indicates that the media resources matching the filters shall not be cached by the 5GMSd AS and shall be marked as not to be cached when served by the 5GMSd AS at M4d. |
|  maxAge | Integer | 0..1 | The caching time-to-live period that shall be set on ingested media resources matching the filters. This determines the minimum period for which the 5GMSd AS shall cache matching media resources as well as the time-to-live period signalled by the 5GMSd AS at interface M4d when it serves such media resources.The time-to-live for a given media resource shall be calculated relative to the time it was ingested. |
|  geoFencing | Object | 0..N | Limit access to the content to the indicated geographic areas. |
|  locatorType | Uri | 1..1 | The type of the locators shall be indicated using a fully-qualified term identifier URI from the controlled vocabulary urn:3gpp:5gms:‌locator‑type, as specified in clause 7.6.4.6, or else from a vendor-specific vocabulary. |
|  locators | Array(String) | 1..1 | Array of locators from which access to the resources is to be allowed. The format of the locator strings shall be determined by the value of locatorType, as specified in clause 7.6.4.6. |
|  urlSignature | Object | 0..1 | Defines the URL signing scheme. Only correctly signed and valid URLs will be allowed to access the content resource at M4d. |
|  urlPattern | String | 1..1 | A pattern that shall be used by the 5GMSd AS to match M4d media resource URLs. The 5GMSd AS shall not serve a matching media resource at M4d unless it includes a valid authentication token calculated over the portion of the M4d request URL that matches this pattern. The format of the pattern shall be a regular expression as specified in [5]. |
|  tokenName | String | 1..1 | The name of the M4d request query parameter that the Media Player should use to present the authentication token when required to do so. |
|  passphraseName | String | 1..1 | The name of the query parameter that is used to refer to the passphrase when constructing the authentication token.Note that the token is not included in the cleartext part of the M4d URL query component. |
|  passphrase | String | 1..1 | The shared secret between the 5GMSd Application Provider and the 5GMSd AS for this distributionConfiguration.The passphrase is used in the computation and verification of the M4d authentication token but is never sent in-the-clear over that interface. |
|  tokenExpiryName | String | 1..1 | The name of the M4d request query parameter that the Media Player should use to present the token expiry field. |
|  useIPAddress | Boolean | 1..1 | If set to True, the IP address of the UE is included in the computation of the authentication token for resources that match urlPattern and access to matching media resources shall be allowed by the 5GMSd AF only when the M4d request is made from a UE with this IP address. |
|  ipAddressName | String | 0..1 | The name of the M4d request query parameter that is encoded as part of the authentication token if the useIPAddress flag is set to True.Note that the IP address is not passed in the cleartext part of the M4d URL query component. |
|  certificateId | ResourceId | 0..1 | When content is distributed using TLS [16], the X.509 [8] certificate for the origin domain is shared with the 5GMSd AF so that it can be presented by the 5GMSd AS in the TLS handshake at M4d. This attribute indicates the identifier of the certificate to use. |

NEXT CHANGE

#### 7.6.4.3 Cache purging

The 5GMSd Application Provider may perform a purge operation to invalidate some or all cached media resources of a particular Content Hosting Configuration. A regular expression describing the set of media resource URLs to be purged from the 5GMSd AS cache for the Content Hosting Configuration in question shall be supplied in the body of the request. The body shall be encoded using the application/x-www-form-urlencoded MIME content type as a key–value pair, with the key being the string pattern and the value being the regular expression.

On receiving a purge request, the 5GMSd AF shall immediately invalidate all media resources in the 5GMSd AS cache matching the regular expression by declaring them as stale. Any request at reference point M4d for a purged media resource will trigger the fetching (and possible caching) of the current version from the origin via M2d in case of a Pull-based ingest. For Push-based ingest, M4d requests for purged content shall be responded to with a 404 (Not Found) HTTP response, until a new version of the object is pushed by the origin to the 5GMSd AS via M2d.

If the procedure is successful, the 5GMSd AF shall respond with one of the following response messages:

- 204 (No Content) if no cache entries were purged, for example because no current cache entries matched the regular expression supplied in the original request.

- 200 (OK) if some cache entries were purged. The body of the response message shall indicate the total number of cache entries purged in all 5GMSd AS instances distributing the Provisioning Session in question.

If the procedure is not successful, the 5GMSd AF shall provide a response code as defined in clause 6.3. In addition, the HTTP response 422 (Unprocessable Entity) shall be returned in the case where the request message body – or the regular expression contained in it – are found by the 5GMSd AF to be syntactically malformed.

NEXT CHANGE

### 7.9.1 Overview

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

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

The state of a Policy Template can be:

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

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

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

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

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

- The qosReference value is obtained with the Service Level Agreement. See TS 23.502 [45] for detailed usage.

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

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

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

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

applicationSessionContext is a mandatory child object, which contains at least the aspId property.

- The aspId identifies the API invoker.

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

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

- When present, the afAppId property contains an application identifier referencing one or more PFD objects. The value of the afAppId property is provided to the PCF with each new Npcf\_PolicyAuthorization service instance.

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: Definition of PolicyTemplate resource

| Property | Type | Cardinality | Usage | Visibility | Description |
| --- | --- | --- | --- | --- | --- |
| policyTemplateId | ResourceId | 1..1 | C: ROR: ROU: RO |  | Unique identifier of this Policy Template within the scope of the Provisioning Session. |
| state | Enumeration of Strings | 1..1 | C: ROR: ROU: 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. |
| apiEndPoint | String | 1..1 | C: RWR: ROU: RW | MNO Admin | The API endpoint that should be invoked when activating a Dynamic Policy Instance based on this Policy Template. |
| apiType | Enumeration of Strings | 1..1 | C: RWR: ROU: RW | MNO Admin | N5: Indicates direction invocation of the Npcf\_PolicyAuthorization service by the 5GMS AF.N33: Indicates invocation of the Nnef\_AsSessionWithQoS or Nnef\_ChargableParty services by the 5GMS AF via the Network Exposure Function. |
| externalReference | String | 1..1 | C: RWR: ROU: 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: RWR: ROU: 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. |
|  afAppId | AfAppId | 0..1 | C: RWR: RWU: RW  |  | As defined in clause 5.6.2.3 of TS 29.514 [34] and clause 5.3.2 of TS 29.571 [12]. |
|  sliceInfo | Snssai | 0..1 | C: RWR: RWU: RW |  |
|  dnn | Dnn | 0..1 | C: RWR: RWU: RW |  |
|  aspId | AspId | 1..1 | C: RWR: RWU: RW |  |
| chargingSpecification | ChargingSpecification | 0..1 | C: RWR: RWU: RW  |  | Provides information about the charging policy to be used for this Policy Template. |

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 |
| entryPoint | AbsoluteUrl | 0..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. |
| 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.(Opaque URL, following the 5GMS URL format.) |
| locationReporting | Boolean | 1..1 | RO | Stipulates whether the Media Session Handler is required to provide location data to the 5GMSd AF in consumption reporting messages (in case of MNO or trusted third parties). |
| 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.(Opaque URL, following the 5GMS URL format.) |
| 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.(Opaque URL, following the 5GMS URL format.) |
| scheme | Uri | 1..1 | RO | The metrics reporting scheme that metrics reports shall use (see clause 4.7.5). |
| dataNetworkName | Dnn | 0..1 | RO | The DNN which shall be used when sending metrics reports. If not specified, the name of the default DN shall be used. |
| 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 URL patterns for which metrics reporting shall be done. The format of each pattern shall be a regular expression as specified in [5].If not specified, reporting shall be done for all sessions. |
| metrics | Array(String) | 1..1 | RO | A list of metrics which shall be reported. |
| networkAssistance‌Configuration | Object | 0..1 | RO |  | downlink,uplink |
| serverAddresses | Array(AbsoluteUrl) | 1..1 | RO | A list of 5GMS AF addreses (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. |
| 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 resolution) to direct requests to a suitable AF instance. |

NEXT CHANGE

#### 11.3.3.1 ConsumptionReport format

This type represents the format of consumption report instance. This structure is used by the Media Session Handler to report the consumption.

Table 11.3.3.1-1: Definition of ConsumptionReport format

|  |  |  |  |
| --- | --- | --- | --- |
| Property name | Data type | Cardinality | Description |
| mediaPlayerEntry | AbsoluteUrl | 1..1 | Identifies the Media Entry Point.In the case of DASH, thisshall be the URL of the MPD at reference point M4d. |
| reportingClientId | string | 1..1 | Identifier of the reporting client that consumed the streaming media service associated with this consumption report.If available to the Media Session Handler, a GPSI value (see clause 28.8 of TS 23.003 [7]); otherwise, a stable and globally unique string. |
| consumptionReportingUnits | Array(Consumption‌Reporting‌Unit) | 1..1 | An array of consumption reporting units. |

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: ROR: ROU: RO | Unique identifier for this Network Assistance Session. |
| serviceDataFlowInformation | Array(ServiceDataFlowDescription) | 0..1 | C: RWR: ROU: RW | Identification of the application flows for the media streaming session for which Network Assistance is to be used, e.g. 2-tuple (IP addresses) or 5-tuple (IP Addresses, protocol and ports). |
| policyTemplateId | ResourceId | 0..1 | C: RWR: ROU: RW | Identification of the policy that is in force for the media streaming session. |
| requestedQoS | M5QoSSpecification | 0..1 | C: RWR: ROU: RW | The requested QoS parameters. |
| recommendedQoS | M5QoSSpecification | 0..1 | C: ROR: ROU: RO | The QoS parameters currently recommended by the 5GMS AF. |
| notficationURL | AbsoluteUrl | 0..1 | C: ROR: ROU: 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

## 12.2 Media Session Handling for Downlink media streaming – APIs and Functions

(SNIPPED)

### 12.2.3 General

Table 12.2.3-1 provides a list status information that can be obtained from the Media Session Handler through reference point M6d.

Table 12.2.3-1: General Status Information

|  |  |  |  |
| --- | --- | --- | --- |
| Status | Type | Parameter | Definition |
|  |  |  |  |

Table 12.2.3-2 provides a list of general notification events exposed at reference point M6d.

Table 12.2.3-2: General Notification Events

|  |  |  |
| --- | --- | --- |
| Event | Definition | Payload |
| SESSION\_HANDLING\_ACTIVATED | Triggered when media session handling was activated for a specific Media Entry Point. | Media Entry Point URL. |
| SESSION\_HANDLING\_STOPPED | Triggered when media session handling stopped for a specific Media Entry Point. | Media Entry Point URL. |

Table 12.2.3-3 provides a list of general error events exposed at reference point M6d.

Table 12.2.3-3: General Error Events

|  |  |  |
| --- | --- | --- |
| Status | Definition | Payload |
| ERROR\_SESSION\_HANDLING | Triggered when there is an error in the media session handling. | Not applicable. |

(SNIPPED)

### 12.2.6 Consumption Reporting Information

Table 12.2.6-1 provides a list status information that can be obtained from the Media Session Handler through reference point M6d.

Table 12.2.6-1: Status Information relating to Consumption Reporting

|  |  |  |  |
| --- | --- | --- | --- |
| Status | Type | Parameter | Definition |
| consumptionReport | Object |  | The most recently sent consumption report. |

Table 12.2.6-2 provides a list of general notification events exposed by the Media Session Handler at reference point M6d.

Table 12.2.6-2: Notification Events relating to Consumption Reporting

|  |  |  |
| --- | --- | --- |
| Status | Definition | Payload |
| CONSUMPTION\_REPORTING\_ACTIVATED | Consumption reporting has been activated. | Not applicable. |
| CONSUMPTION\_REPORTING\_STOPPED | Consumption reporting has been stopped. | Not applicable. |
| NEW\_CONSUMPTION\_REPORT | A new consumption report is available and has been sent. | Not applicable. |

Table 12.2.6-3 provides a list of general error events exposed by the Media Session Handler at reference point M6d.

Table 12.2.6-3: Error Events relating to Consumption Reporting

|  |  |  |
| --- | --- | --- |
| Status | Definition | Payload |
| ERROR\_CONSUMPTION\_REPORTING | Error in consumption reporting occurred. | Server address,Provisioning Session Id,HTTP response codeError message. |

### 12.2.7 Metrics Reporting Information

Table 12.2.7-1 provides a list of status information that can be obtained from the Media Session Handler through M6d.

Table 12.2.7-1: Status Information relating to Metrics Reporting

|  |  |  |
| --- | --- | --- |
| Status | Type | Definition |
| lastMetricsReport | Object | Status information relating to the last sent metrics report. |
|  provisioningSessionId | ResourceId | The Provisioning Seession identifier for this metrics report. |
|  metricsReportingConfigurationId | ResourceId | The metrics reporting configuration identifier for this report. |
|  Scheme | Uri | The metrics reporting scheme used by this metrics report (see clause 4.7.5). |
|  metricsReport | Object | The most recently sent metrics report. |

Table 12.2.7-2 provides a list of general notification events exposed at reference point M6d.

Table 12.2.7-2: Notification Events relating to Metrics Reporting

|  |  |  |
| --- | --- | --- |
| Event | Definition | Payload |
| METRICS\_REPORTING\_ACTIVATED | Metrics reporting has been activated. | Not applicable. |
| METRICS\_REPORTING\_STOPPED | Metrics reporting has been stopped. | Not applicable. |
| NEW\_METRICS\_REPORT | A new metrics report is available and has been sent. | Not applicable. |

Table 12.2.7-3 provides a list of general error events exposed at reference point M6d.

Table 12.2.7-3: Error Events relating to Metrics Reporting

|  |  |  |
| --- | --- | --- |
| Error event | Definition | Payload |
| ERROR\_METRICS\_REPORTING | Error in metrics reporting occurred. | Server address,Provisioning Session Id,Metrics Reporting Configuration Id,HTTP response codeError message.  |

Details of status information for RAN-based metrics reporting are for further study.

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### 13.2.5 Notifications and error events

Table 13.2.5-1 provides a list of notification events that are provided by the Media Player.

Table 13.2.5-1: Notification events

|  |  |  |
| --- | --- | --- |
| Status | Definition | Payload |
| AST\_IN\_FUTURE | Triggered when playback will not start yet as the MPD's availabilityStartTime is in the future. | Time before playback will start. |
| AVAILABLE\_MEDIA\_CHANGED | The list of available media has changed. | Media type:video, audio, subtitle, all |
| BUFFER\_EMPTY | Triggered when the media playback platform's buffer state changes to stalled. | Media Type |
| BUFFER\_LOADED | Triggered when the media playback platform's buffer state changes to loaded. | Media Type |
| CAN\_PLAY | Sent when enough data is available that the media can be played. | Not applicable. |
| MANIFEST\_LOADED | Triggered when the manifest load is complete | Not applicable. |
| METRIC\_ADDED | Triggered every time a new metric is added. |  |
| METRIC\_CHANGED | The minimum bit rate that the ABR algorithms will choose. Use NaN for no limit. |  |
| METRIC\_UPDATED | Set to true if you would like DASH Client to keep downloading fragments in the background when the video element is paused. |  |
| METRICS\_CHANGED | Triggered whenever there is a change to the overall metrics. |  |
| OPERATION\_POINT\_CHANGED | Triggered whenever there is a change of an operation point parameter. | External reference identifier of currently selected Service Operation Point. |
| PLAYBACK\_ENDED | Sent when playback completes. |  |
| PLAYBACK\_ERROR | Sent when an error occurs. The element's error attribute contains more information. | Error attribute. |
| PLAYBACK\_PAUSED | Sent when playback is paused. |  |
| PLAYBACK\_PLAYING | Sent when the media begins to play (either for the first time, after having been paused, or after ending and then restarting). |  |
| PLAYBACK\_SEEKED | Sent when a seek operation completes. |  |
| PLAYBACK\_SEEKING | Sent when a seek operation begins. |  |
| PLAYBACK\_STALLED | Sent when the media playback platform reports stalled |  |
| PLAYBACK\_STARTED | Sent when playback of the media starts after having been paused; that is, when playback is resumed after a prior pause event. |  |
| PLAYBACK\_WAITING | Sent when the media playback has stopped because of a temporary lack of data. |  |
| SERVICE\_DESCRIPTION\_SELECTED | sent when the DASH client has selected a service description. |  |
| SERVICE\_DESCRIPTION\_CHANGED | Sent when the DASH client has changed a service description. |  |
| SERVICE\_DESCRIPTION\_VIOLATED | Provides notification that the service description parameters are currently not met. | Parameters of service description that are not met. |
| SOURCE\_INITIALIZED | Triggered when the source is setup and ready. |  |

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### 13.2.6 Status Information

Table 13.2.6-1 provides a list of dynamically changing status information that can be obtained from the client.

Table 13.2.6-1: Dynamic Status information

|  |  |  |  |
| --- | --- | --- | --- |
| Status | Type | Parameter | Definition |
| state | Enumeration |  | An enumerated value from table 13.2.2‑1 indicating the current state of the Media Player. |
| averageThroughput | float | none | Current average throughput computed in the ABR logic in bit/s. |
| bufferLength | float | MediaType"video", "audio" and "subtitle" | Current length of the buffer for a given media type, in seconds. If no type is passed in, then the minimum of video, audio and subtitle buffer length is returned. NaN is returned if an invalid type is requested, the presentation does not contain that type, or if no arguments are passed and the presentation does not include any adaption sets of valid media type. |
| liveLatency | float | none | Current live stream latency in seconds based on the latency measurement. |
| mediaSetting[] | MPDAdaptationSet | MediaType"video", "audio" and "subtitle" | Current media settings for each media type based on the CMAF Header and the MPD information based on the selected Adaptation Set for this media type. |
| mediaTime | float | None | Current media playback time from media playback platform. The media time is in seconds and is relative to the start of the playback and provides the media that is actually rendered. |
| playbackRate | float | None | The current rate of playback. For a video that is playing twice as fast as the default playback, the playbackRate value should be 2.00. |
| availableServiceDescriptions[] | Provides the available service descriptions |  | Provides the list of available selectable service descriptions with an id to select from. Those are either configured ones or the ones in the MPD. |
| availableMediaOptions[] | List of Adaptation Set or Preselection ids | MediaType"video", "audio" "subtitle""all" | Provides the list of available media options that can be selected by the application based on the capability discovery and the subset information. |
| service‌Operation‌Points | Array(Service‌Operation‌Point) |  | The set of Service Operation Points declared in the presentation manifest (e.g. DASH MPD) of the current media presentation. |
| operative‌Service‌Operation‌Point | integer |  | A zero-based index into the service‌Operation‌Points array indicating the Service Operation Point currently operative in the playback session.Set to -1 if the array is empty. |
| metrics[][] | Metrics |  | A data blob of metrics for each configured metrics collecting scheme. |

Table 13.2.6-2 provides a list of configured operation point information that can be obtained from the client. Any change to a parameter below shall be announced with a notification OPERATION\_POINT\_CHANGED.

Table 13.2.6-2: Service Operation Point Information

|  |  |  |
| --- | --- | --- |
| Parameter | Type | Definition |
| ServiceOperationPoint | Object | The currently configured operation point parameters according to which the DASH client is operating. |
|  | externalIdentifier | String | The external identifier uniquely identifying this Operation Point in the presentation manifest (e.g. DASH MPD). |
|  | mode | Enum | The following operation modes are defined:live: The DASH client operates to maintain configured target latencies using playback rate adjustments and possibly resync.Vod: The DASH client operates without latency requirements and rebuffering may result in additional latencies |
|  | maxBufferTime | Integer | maximum buffer time in milliseconds for the service. |
|  | switchBufferTime | Integer | buffer time threshold below which the DASH clients attempts to switch Representations. |
|  | latency | Object | Defines the latency parameters used by the DASH client when operating in live mode. |
|  |  | target | Integer | The target latency for the service in milliseconds. |
|  |  | max | Integer | The maximum latency for the service in milliseconds. |
|  |  | min | Integer | The maximum latency for the service in milliseconds. |
|  | playbackRate | MediaTypeaudio, video, all | Defines the playback rate parameters used by the DASH client for catchup mode and deceleration to avoid buffer underruns and maintaining target latencies. |
|  |  | max | Real | The maximum playback rate for the purposes of automatically adjusting playback latency and buffer occupancy during normal playback, where 1.0 is normal playback speed. |
|  |  | min | Real | The minimum playback rate for the purposes of automatically adjusting playback latency and buffer occupancy during normal playback, where 1.0 is normal playback speed. |
|  | bitRate |  | Defines the operating bandwidth parameters used by the DASH client used for a specific media type or aggregated. The values are on IP level. |
|  |  | target | Integer | The target bandwidth for the service in bit/s that the client is configured to consume. |
|  |  | max | Integer | The maximum bandwidth for the service in bit/s that the client is configured to consume. |
|  |  | min | Integer | The minimum bandwidth for the service in bit/s that the client is configured to consume. |
|  | playerSpecificParameters |  | Player-specific parameters may be provided, for example about the used algorithm, etc. |

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Annex C (normative):
OpenAPI representation of the 5GMS HTTP REST APIs

# C.1 General

This annex is based on the OpenAPI 3.0.0 specification [23] and provides corresponding representations of all APIs defined in the present document.

NOTE 1: An OpenAPIs representation embeds JSON Schema representations of HTTP message bodies.

This Annex shall take precedence when being discrepant to other parts of the present document with respect to the encoding of information elements and methods within the API(s).

NOTE 2: The semantics and procedures, as well as conditions, e.g. for the applicability and allowed combinations of attributes or values, not expressed in the OpenAPI definitions but defined in other parts of the specification also apply.

# C.2 Data Types applicable to several APIs

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

|  |
| --- |
| openapi: 3.0.0info:  title: 5GMS Common Data Types  version: 1.0.1  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 V16.9.0; 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, comforming with the "URI-reference" production specified in IETF RFC 3986, section 4.1.'    RelativeUrl:      type: string      format: uri-reference      description: 'Relatve Uniform Resource Locator, comforming 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, comforming with the "absolute-URI" production specified in IETF RFC 3986, section 4.3 in which the scheme part is "http" or "https". Note that the "query" suffix is permitted by this production but the "fragment" suffix is not.'     #####################################    # Clause 6.4.3: Structured data types    #####################################    IpPacketFilterSet:      type: object      required:        - direction      properties:        srcIp:          type: string        dstIp:          type: string        protocol:          type: integer        srcPort:          type: integer        dstPort:          type: integer        toSTc:          type: string        flowLabel:          type: integer        spi:          type: integer        direction:          type: string    ServiceDataFlowDescription:      type: object      properties:        flowDescription:          $ref: '#/components/schemas/IpPacketFilterSet'        domainName:          type: string    M5QoSSpecification:      type: object      required:        - marBwDlBitRate        - marBwUlBitRate        - mirBwDlBitRate        - mirBwUlBitRate      properties:        marBwDlBitRate:          $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'        marBwUlBitRate:          $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'        minDesBwDlBitRate:          $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'        minDesBwUlBitRate:          $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'        mirBwDlBitRate:          $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'        mirBwUlBitRate:          $ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'        desLatency:          type: integer          minimum: 0        desLoss:          type: integer          minimum: 0    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    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. |

# C.3 OpenAPI representation of the M1 APIs

## C.3.1 M1\_ProvisioningSessions API

|  |
| --- |
| openapi: 3.0.0info:  title: M1\_ProvisioningSessions  version: 1.1.1  description: |    5GMS AF M1 Provisioning Sessions API    © 2023, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).    All rights reserved.tags:  - name: M1\_ProvisioningSessions    description: '5G Media Streaming: Provisioning (M1) APIs: Provisioning Sessions'externalDocs:  description: 'TS 26.512 V16.9.0; 5G Media Streaming (5GMS); Protocols'  url: 'https://www.3gpp.org/ftp/Specs/archive/26\_series/26.512/'servers:  - url: '{apiRoot}/3gpp-m1/v1'    variables:      apiRoot:        default: https://example.com        description: See 3GPP TS 29.512 clause 6.1.paths:  /provisioning-sessions:    post:      operationId: createProvisioningSession      summary: 'Create a new Provisioning Session'      responses:        '201':          description: 'Provisioning Session Created'          headers:            Location:              description: 'URL including the resource identifier of the newly created Provisioning Session.'              required: true              schema:                $ref: 'TS26512\_CommonData.yaml#/components/schemas/AbsoluteUrl'          content:            application/json:              schema:                $ref: '#/components/schemas/ProvisioningSession'  /provisioning-sessions/{provisioningSessionId}:    parameters:        - name: provisioningSessionId          in: path          required: true          schema:            $ref: 'TS26512\_CommonData.yaml#/components/schemas/ResourceId'          description: 'The resource identifier of an existing Provisioning Session.'    get:      operationId: getProvisioningSessionById      summary: 'Retrieve an existing Provisioning Session'      responses:        '200':          description: 'Success'          content:            application/json:              schema:                $ref: '#/components/schemas/ProvisioningSession'    delete:      operationId: destroyProvisioningSession      summary: 'Destroy an existing Provisioning Session'      responses:        '204':          description: 'Provisioning Session Destroyed'          # No Contentcomponents:  schemas:    ProvisioningSession:      type: object      description: "A representation of a Provisioning Session."      required:        - provisioningSessionId        - provisioningSessionType      properties:        provisioningSessionId:          $ref: 'TS26512\_CommonData.yaml#/components/schemas/ResourceId'        provisioningSessionType:          $ref: 'TS26512\_CommonData.yaml#/components/schemas/ProvisioningSessionType'        aspId:          $ref: 'TS29514\_Npcf\_PolicyAuthorization.yaml#/components/schemas/AspId'        serverCertificateIds:          type: array          items:            $ref: 'TS26512\_CommonData.yaml#/components/schemas/ResourceId'          minItems: 1        contentPreparationTemplateIds:          type: array          items:            $ref: 'TS26512\_CommonData.yaml#/components/schemas/ResourceId'          minItems: 1        metricsReportingConfigurationIds:          type: array          items:            $ref: 'TS26512\_CommonData.yaml#/components/schemas/ResourceId'          minItems: 1        policyTemplateIds:          type: array          items:            $ref: 'TS26512\_CommonData.yaml#/components/schemas/ResourceId'          minItems: 1 |

## C.3.2 M1\_ServerCertificatesProvisioning API

|  |
| --- |
| openapi: 3.0.0info:  title: M1\_ServerCertificatesProvisioning  version: 1.1.0  description: |    5GMS AF M1 Server Certificates Provisioning API    © 2023, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).    All rights reserved.tags:  - name: M1\_ServerCertificatesProvisioning    description: '5G Media Streaming: Provisioning (M1) APIs: Server Certificates Provisioning'externalDocs:  description: 'TS 26.512 V16.9.0; 5G Media Streaming (5GMS); Protocols'  url: 'https://www.3gpp.org/ftp/Specs/archive/26\_series/26.512/'servers:  - url: '{apiRoot}/3gpp-m1/v1'    variables:      apiRoot:        default: https://example.com        description: See 3GPP TS 29.512 clause 6.1.paths:  /provisioning-sessions/{provisioningSessionId}/certificates:    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: createOrReserveServerCertificate      summary: 'Create or reserve a Service Certificate resource'      description: 'Without the optional csr query parameter, an X.509 certificate is generated and this is returned. If the csr query parameter is present, a Certificate Signing Request is instead generated and returned, allowing the X.509 certificate to be generated by the invoker and later uploaded.'      parameters:        - in: query          name: csr          schema:             type: string          description: 'When present, return a Certificate Signing Request instead of generating an X.509 certificate'      responses:        '200':          description: 'Server Certificate Created'          headers:            Location:               description: 'URL of the newly created Server Certificate resource'              required: true              schema:                $ref: 'TS26512\_CommonData.yaml#/components/schemas/Url'          content:            'application/x-pem-file':              schema:                type: string    /provisioning-sessions/{provisioningSessionId}/certificates/{certificateId}:    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: certificateId        in: path        required: true        schema:          $ref: 'TS26512\_CommonData.yaml#/components/schemas/ResourceId'        description: 'The resource identifier of an existing Server Certificate'    put:      operationId: uploadServerCertificate      summary: "Upload the X.509 certificate for a previously reserved Server Certificate resource"      requestBody:        required: true        content:          application/x-pem-file:            schema:              type: string      responses:        '204':          description: 'Server Certificate Updated'    get:      operationId: retrieveServerCertificate      summary: 'Retrieve the X.509 certificate representation of the specified Server Certificate resource'      responses:        '200':          description: 'Success'          content:            'application/x-pem-file':              schema:                type: string        '204':          description: 'Awaiting Upload'        '404':          description: 'Not Found'    delete:      operationId: destroyServerCertificate      summary: 'Destroy an existing Server Certificate resource'      responses:        '200':          # OK          description: 'Server Certificate Destroyed'          content:            'application/x-pem-file':              schema:                type: string        '204':          # No Content          description: 'Server Certificate Destroyed'        '404':          # Not Found          $ref: 'TS29571\_CommonData.yaml#/components/responses/404'        '409':          # Conflict          $ref: 'TS29571\_CommonData.yaml#/components/responses/409'        '410':          # Gone          $ref: 'TS29571\_CommonData.yaml#/components/responses/410' |

## C.3.3 M1\_ContentPreparationTemplatesProvisioning API

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| --- |
| openapi: 3.0.0info:  title: M1\_ContentPreparationTemplatesProvisioning  version: 1.1.0  description: |    5GMS AF M1 Content Preparation Templates Provisioning API    © 2023, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).    All rights reserved.tags:  - name: M1\_ContentPreparationTemplatesProvisioning    description: '5G Media Streaming: Provisioning (M1) APIs: Content Preparation Templates Provisioning'externalDocs:  description: 'TS 26.512 V16.9.0; 5G Media Streaming (5GMS); Protocols'  url: 'https://www.3gpp.org/ftp/Specs/archive/26\_series/26.512/'servers:  - url: '{apiRoot}/3gpp-m1/v1'    variables:      apiRoot:        default: https://example.com        description: See 3GPP TS 29.512 clause 6.1.paths:  /provisioning-sessions/{provisioningSessionId}/content-preparation-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: createContentPreparationTemplate      summary: 'Create (and optionally upload) a new Content Preparation Template for the specified Provisioning Session'      requestBody:        description: 'A Content Preparation Template of any type'        required: true        content:          '\*/\*':            schema:              type: string      responses:        '201':          description: 'Content Preparation Template Created'          headers:            Location:              description: 'URL of the newly created Content Preparation Template.'              required: true              schema:                $ref: 'TS26512\_CommonData.yaml#/components/schemas/AbsoluteUrl'  /provisioning-sessions/{provisioningSessionId}/content-preparation-templates/{contentPreparationTemplateId}:    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: contentPreparationTemplateId        in: path        required: true        schema:           $ref: 'TS26512\_CommonData.yaml#/components/schemas/ResourceId'        description: 'The resource identifier of an existing Content Preparation Template.'    get:      operationId: retrieveContentPreparationTemplate      summary: 'Retrieve the specified Content Preparation Template of the specified Provisioning Session'      responses:        '200':          description: 'Success'          content:            '\*/\*':              schema:                type: string    put:      operationId: updateContentPreparationTemplate      summary: 'Update the specified Content Preparation Template for the specified Provisioning Session'      requestBody:        description: 'A Content Preparation Template of any type'        required: true        content:          '\*/\*':            schema:              type: string      responses:        '204':          description: 'Updated Content Preparation Template'        '404':          description: 'Not Found'    patch:      operationId: patchContentPreparationTemplate      summary: 'Patch the specified Content Preparation Template for the specified Provisioning Session'      requestBody:        description: 'A Content Preparation Template patch of any type'        required: true        content:          application/merge-patch+json:            schema:              type: string          application/json-patch+json:            schema:              type: string      responses:        '200':          description: 'Patched Content Preparation Templates'          content:            '\*/\*':              schema:                type: string        '404':          description: 'Not Found'    delete:      operationId: destroyContentPreparationTemplate      summary: 'Destroy the specified Content Preparation Template of the specified Provisioning Session'      responses:        '200':          # OK          description: 'Content Preparation Template Destroyed'          content:            '\*/\*':              schema:                type: string        '204':          # No Content          description: 'Content Preparation Template Destroyed'        '404':          # Not Found          $ref: 'TS29571\_CommonData.yaml#/components/responses/404'        '409':          # Conflict          $ref: 'TS29571\_CommonData.yaml#/components/responses/409'        '410':          # Gone          $ref: 'TS29571\_CommonData.yaml#/components/responses/410' |

## C.3.4 M1\_ContentProtocolsDiscovery API

(SNIPPED: NO CHANGES TO THIS CLAUSE)

## C.3.5 M1\_ContentHostingProvisioning API

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| openapi: 3.0.0info:  title: M1\_ContentHostingProvisioning  version: 1.3.0  description: |    5GMS AF M1 Content Hosting Provisioning API    © 2023, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).    All rights reserved.tags:  - name: M1\_ContentHostingProvisioning    description: '5G Media Streaming: Provisioning (M1) APIs: Content Hosting Provisioning'externalDocs:  description: 'TS 26.512 V16.9.0; 5G Media Streaming (5GMS); Protocols'  url: 'https://www.3gpp.org/ftp/Specs/archive/26\_series/26.512/'servers:  - url: '{apiRoot}/3gpp-m1/v1'    variables:      apiRoot:        default: https://example.com        description: See 3GPP TS 29.512 clause 6.1.paths:  /provisioning-sessions/{provisioningSessionId}/content-hosting-configuration:    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: createContentHostingConfiguration      summary: 'Create (and optionally upload) the Content Hosting Configuration for the specified Provisioning Session'      requestBody:        description: 'A JSON representation of a Content Hosting Configuration'        required: true        content:          application/json:            schema:              $ref: '#/components/schemas/ContentHostingConfiguration'      responses:        '201':          description: 'Content Hosting Configuration Created'          headers:            Location:              description: 'URL of the newly created Content Hosting Configuration (same as request URL).'              required: true              schema:                $ref: 'TS26512\_CommonData.yaml#/components/schemas/AbsoluteUrl'    get:      operationId: retrieveContentHostingConfiguration      summary: 'Retrieve the Content Hosting Configuration of the specified Provisioning Session'      responses:        '200':          description: 'Success'          content:            application/json:              schema:                $ref: '#/components/schemas/ContentHostingConfiguration'        '404':          description: 'Not Found'    put:      operationId: updateContentHostingConfiguration      summary: 'Update the Content Hosting Configuration for the specified Provisioning Session'      requestBody:        description: 'A JSON representation of a Content Hosting Configuration'        required: true        content:          application/json:            schema:              $ref: '#/components/schemas/ContentHostingConfiguration'      responses:        '204':          description: 'Updated Content Hosting Configuration'        '404':          description: 'Not Found'    patch:      operationId: patchContentHostingConfiguration      summary: 'Patch the Content Hosting Configuration for the specified Provisioning Session'      requestBody:        description: 'A JSON representation of a Content Hosting Configuration'        required: true        content:          application/merge-patch+json:            schema:              $ref: '#/components/schemas/ContentHostingConfiguration'          application/json-patch+json:            schema:              $ref: '#/components/schemas/ContentHostingConfiguration'      responses:        '200':          description: 'Patched Content Hosting Configuration'          content:            application/json:              schema:                $ref: '#/components/schemas/ContentHostingConfiguration'        '404':          description: 'Not Found'    delete:      operationId: destroyContentHostingConfiguration      summary: 'Destroy the current Content Hosting Configuration of the specified Provisioning Session'      responses:        '204':          description: 'Destroyed Content Hosting Configuration'        '404':          description: 'Not Found'            /provisioning-sessions/{provisioningSessionId}/content-hosting-configuration/purge:    parameters:        - name: provisioningSessionId          in: path          required: true          schema:            $ref: 'TS26512\_CommonData.yaml#/components/schemas/ResourceId'          description: A unique identifier of the Provisioning    post:      operationId: purgeContentHostingCache      summary: 'Purge the content of the cache for the Content Hosting Configuration of the specified Provisioning Session'      requestBody:        description: 'The regular expression pattern for resources to purge from the cache'        required: true        content:          application/x-www-form-urlencoded:            schema:              properties:                pattern:                   description: 'The regular expression'                  type: string      responses:        '200':          description: 'Content Purged'components:  schemas:    IngestConfiguration:      type: object      description: 'A configuration for content ingest.'      properties:        pull:          type: boolean        protocol:          $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uri'        baseURL:          $ref: 'TS26512\_CommonData.yaml#/components/schemas/AbsoluteUrl'    PathRewriteRule:      type: object      description: 'A rule to manipulate URL paths.'      required:        - requestPathPattern        - mappedPath      properties:        requestPathPattern:          type: string        mappedPath:          type: string    CachingConfiguration:      type: object      description: 'A content caching configuration.'      required:        - urlPatternFilter      properties:        urlPatternFilter:          type: string        cachingDirectives:          type: object          required:            - noCache          properties:            statusCodeFilters:              type: array              items:                type: integer            noCache:              type: boolean            maxAge:              type: integer              format: int32    DistributionConfiguration:      type: object      description: 'A content distribution configuration.'      properties:        contentPreparationTemplateId:          $ref: 'TS26512\_CommonData.yaml#/components/schemas/ResourceId'        canonicalDomainName:          type: string        domainNameAlias:          type: string        baseURL:          $ref: 'TS26512\_CommonData.yaml#/components/schemas/AbsoluteUrl'        pathRewriteRules:          type: array          items:            $ref: '#/components/schemas/PathRewriteRule'        cachingConfigurations:          type: array          items:            $ref: '#/components/schemas/CachingConfiguration'        geoFencing:          type: object          required:            - locatorType            - locators          properties:            locatorType:              $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uri'            locators:              type: array              items:                 type: string                description: 'Format of individual locators depends on the locatorType.'              minItems: 1        urlSignature:          type: object          required:            - urlPattern            - tokenName            - passphraseName            - passphrase            - tokenExpiryName            - useIPAddress          properties:            urlPattern:              type: string            tokenName:              type: string            passphraseName:              type: string            passphrase:              type: string            tokenExpiryName:              type: string            useIPAddress:              type: boolean            ipAddressName:              type: string        certificateId:          $ref: 'TS26512\_CommonData.yaml#/components/schemas/ResourceId'    # Schema for the resource itself    ContentHostingConfiguration:      type: object      description: "A representation of a Content Hosting Configuration resource."      required:        - name        - ingestConfiguration        - distributionConfigurations      properties:        name:          type: string        entryPointPath:          $ref: 'TS26512\_CommonData.yaml#/components/schemas/RelativeUrl'        ingestConfiguration:          $ref: '#/components/schemas/IngestConfiguration'        distributionConfigurations:          type: array          items:            $ref: '#/components/schemas/DistributionConfiguration' 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## C.3.6 M1\_ConsumptionReportingProvisioning API

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| --- |
| openapi: 3.0.0info:  title: M1\_ConsumptionReportingProvisioning  version: 1.0.2  description: |    5GMS AF M1 Consumption Reporting Provisioning API    © 2023, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).    All rights reserved.tags:  - name: M1\_ConsumptionReportingProvisioning    description: '5G Media Streaming: Provisioning (M1) APIs: Consumption Reporting Provisioning'externalDocs:  description: 'TS 26.512 V16.9.0; 5G Media Streaming (5GMS); Protocols'  url: 'https://www.3gpp.org/ftp/Specs/archive/26\_series/26.512/'servers:  - url: '{apiRoot}/3gpp-m1/v1'    variables:      apiRoot:        default: https://example.com        description: See 3GPP TS 29.512 clause 6.1.paths:  /provisioning-sessions/{provisioningSessionId}/consumption-reporting-configuration:    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: activateConsumptionReporting      summary: 'Activate the consumption reporting procedure for the specified Provisioning Session by providing the Consumption Reporting Configuration'      requestBody:        description: 'A JSON representation of a Consumption Reporting Configuration'        required: true        content:          application/json:            schema:              $ref: '#/components/schemas/ConsumptionReportingConfiguration'      responses:        '201':          description: 'Consumption Reporting Configuration Created'          headers:            Location:              description: 'URL of the newly created Consumption Reporting Configuration (same as request URL).'              required: true              schema:                $ref: 'TS26512\_CommonData.yaml#/components/schemas/AbsoluteUrl'    get:      operationId: retrieveConsumptionReportingConfiguration      summary: 'Retrieve the Consumption Reporting Configuration of the specified Provisioning Session'      responses:        '200':          description: 'Success'          content:            application/json:              schema:                $ref: '#/components/schemas/ConsumptionReportingConfiguration'    put:      operationId: updateConsumptionReportingConfiguration      summary: 'Update the Consumption Reporting Configuration for the specified Provisioning Session'      requestBody:        description: 'A JSON representation of a Consumption Reporting Configuration'        required: true        content:          application/json:            schema:              $ref: '#/components/schemas/ConsumptionReportingConfiguration'      responses:        '204':          description: 'Updated Consumption Reporting Configuration'        '404':          description: 'Not Found'    patch:      operationId: patchConsumptionReportingConfiguration      summary: 'Patch the Consumption Reporting Configuration for the specified Provisioning Session'      requestBody:        description: 'A JSON representation of a Consumption Reporting Configuration'        required: true        content:          application/merge-patch+json:            schema:              $ref: '#/components/schemas/ConsumptionReportingConfiguration'          application/json-patch+json:            schema:              $ref: '#/components/schemas/ConsumptionReportingConfiguration'      responses:        '200':          description: 'Patched Consumption Reporting Configuration'          content:            application/json:              schema:                $ref: '#/components/schemas/ConsumptionReportingConfiguration'        '404':          description: 'Not Found'    delete:      operationId: destroyConsumptionReportingConfiguration      summary: 'Destroy the current Consumption Reporting Configuration of the specified Provisioning Session'      responses:        '204':          description: 'Destroyed Consumption Reporting Configuration'        '404':          description: 'Not Found'    components:  schemas:    ConsumptionReportingConfiguration:      type: object      description: "A representation of a Consumption Reporting Configuration resource."      properties:        reportingInterval:          $ref: 'TS29571\_CommonData.yaml#/components/schemas/DurationSec'        samplePercentage:          $ref: 'TS26512\_CommonData.yaml#/components/schemas/Percentage'        locationReporting:          type: boolean |

## C.3.7 M1\_MetricsReportingProvisioning API

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| --- |
| openapi: 3.0.0info:  title: M1\_MetricsReportingProvisioning  version: 1.0.2  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 V16.9.0; 5G Media Streaming (5GMS); Protocols'  url: 'https://www.3gpp.org/ftp/Specs/archive/26\_series/26.512/'servers:  - url: '{apiRoot}/3gpp-m1/v1'    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        - scheme      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        metrics:          type: array          items:            type: string          minItems: 1 |

## C.3.8 M1\_PolicyTemplatesProvisioning API

|  |
| --- |
| openapi: 3.0.0info:  title: M1\_PolicyTemplatesProvisioning  version: 1.1.1  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 V16.9.0; 5G Media Streaming (5GMS); Protocols'  url: 'https://www.3gpp.org/ftp/Specs/archive/26\_series/26.512/'servers:  - url: '{apiRoot}/3gpp-m1/v1'    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        - apiEndPoint        - apiType        - 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.        apiEndPoint:          type: string        apiType:          anyOf:          - type: string            enum: [N5, N33]          - 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.        externalReference:          type: string        qoSSpecification:          $ref: 'TS26512\_CommonData.yaml#/components/schemas/M1QoSSpecification'        applicationSessionContext:          type: object          properties:            afAppId:              $ref: 'TS29514\_Npcf\_PolicyAuthorization.yaml#/components/schemas/AfAppId'            sliceInfo:              $ref: 'TS29571\_CommonData.yaml#/components/schemas/Snssai'            dnn:              $ref: 'TS29571\_CommonData.yaml#/components/schemas/Dnn'            aspId:              $ref: 'TS29514\_Npcf\_PolicyAuthorization.yaml#/components/schemas/AspId'        chargingSpecification:          $ref: 'TS26512\_CommonData.yaml#/components/schemas/ChargingSpecification' |

# C.4 OpenAPI representation of the M5 APIs

## C.4.1 M5\_ServiceAccessInformation API

|  |
| --- |
| openapi: 3.0.0info:  title: M5\_ServiceAccessInformation  version: 1.2.0  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 V16.9.0; 5G Media Streaming (5GMS); Protocols'  url: 'https://www.3gpp.org/ftp/Specs/archive/26\_series/26.512/'servers:  - url: '{apiRoot}/3gpp-m5/v1'    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:    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:            entryPoint:              $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            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            - 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              metrics:                type: array                items:                  type: string        networkAssistanceConfiguration:          type: object          required:             - serverAddress          properties:            serverAddresses:              $ref: '#/components/schemas/ServerAddresses' |

## C.4.2 M5\_ConsumptionReporting API

(SNIPPED: NO CHANGES TO THIS CLAUSE)

## C.4.3 M5\_MetricsReporting API

(SNIPPED: NO CHANGES TO THIS CLAUSE)

## C.4.4 M5\_DynamicPolicies API

|  |
| --- |
| openapi: 3.0.0info:  title: M5\_DynamicPolicies  version: 1.1.1  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 V16.9.0; 5G Media Streaming (5GMS); Protocols'  url: 'https://www.3gpp.org/ftp/Specs/archive/26\_series/26.512/'servers:  - url: '{apiRoot}/3gpp-m5/v1'    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'        provisioningSessionId:          $ref: 'TS26512\_CommonData.yaml#/components/schemas/ResourceId'        qosSpecification:          $ref: 'TS26512\_CommonData.yaml#/components/schemas/M5QoSSpecification'        enforcementMethod:          type: string        enforcementBitRate:          type: integer |

## C.4.5 M5\_NetworkAssistance API

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| openapi: 3.0.0info:  title: M5\_NetworkAssistance  version: 1.0.2  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: 3GPP TS 26.512 V16.9.0; 5G Media Streaming (5GMS); Protocols.  url: 'http://www.3gpp.org/ftp/Specs/archive/29\_series/26.512/'servers:  - url: '{apiRoot}/3gpp-m5/v1'    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.'      responses:        '201':          description: 'Created Network Assistance Session'          content:            application/json:              schema:                $ref: '#/components/schemas/NetworkAssistanceSession'          headers:            Location:              description: 'The URL of the nely 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      properties:        naSessionId:          $ref: 'TS26512\_CommonData.yaml#/components/schemas/ResourceId'        serviceDataFlowDescription:          type: array          items:             $ref: 'TS26512\_CommonData.yaml#/components/schemas/ServiceDataFlowDescription'          minItems: 1        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' |

END OF CHANGES