**3GPP TSG-S4 Meeting #110e *S4-201051***

 **Home Office, Everywhere, 19. – 28. August 2020**

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

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

|  |
| --- |
|  |
| ***Title:***  | Updated on M5 Dynamic Policy activation API, M1 Policy Template Provisioning API and the M5 Network Assistance API |
|  |  |
| ***Source to WG:*** | Ericsson LM |
| ***Source to TSG:*** | S4 |
|  |  |
| ***Work item code:*** | 5GMS3 |  | ***Date:*** | <Res\_date> |
|  |  |  |  |  |
| ***Category:*** | **<Cat>** |  | ***Release:*** | <Release> |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)Rel-12 (Release 12)**Rel-13 (Release 13)Rel-14 (Release 14)Rel-15 (Release 15)Rel-16 (Release 16)* |
|  |  |
| ***Reason for change:*** | The document contains changes to the M1 Policy Template API and the M5 Dynamic Policy Invocation API based on the discussion in S4-AHI999 (now S4-AHIa14) and the discussion on available application flow detection mechanisms (in S4-AHIa13). The document is a first draft and may not contain all parameters.  |
|  |  |
| ***Summary of change:*** |  |
|  |  |
| ***Consequences if not approved:*** |  |
|  |  |
| ***Clauses affected:*** |  |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  |  |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  |  |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  |  |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

**\*\*\*\* First Change \*\*\*\***

### 4.3.7.1 General

These procedures are used by the 5GMS Application Provider to configure the Policy Templates for streaming sessions of a particular Provisioning Session.

Since Policy Templates require 5GMS System operator verification, a Policy Template that is newly created cannot be used immediately. Upon creation, a Policy Template shall be in the pending state. Once all mandatory properties are provided, the 5GMS AF triggers the validation. Once it has been validated by the 5GMS System operator, it shall take the ready state, indicating that it may be applied to streaming sessions. If it is subsequently updated by the 5GMS Application Provider, a Policy Template shall return to the pending state, awaiting revalidation by the operator of the 5GMS System. Finally, a Policy Template may be suspended by the 5GMS System operator, e.g. in case of a violation of the usage terms or for some other reasons, which renders it unusable. The update of any property moves the state into pending and triggers re-validation.

The 5GMSd/5GMSu AF shall verify the status of a Policy Template prior to allowing a Dynamic Policy Instance to instantiate it. Only Policy Templates in the ready state are eligible to be instantiated in this way.

Figure 4.3.7.1‑1 below is a state diagram showing the life-cycle of a Policy Template:



Figure 4.3.7.1‑1: Policy Template State Diagram

### 4.3.7.2 Create Policy Template

This procedure is used by the 5GMS Application Provider to create a new Policy Template. The HTTP POST method shall be used for this purpose.

If the procedure is successful, the 5GMSd/5GMSu AF shall generate a resource identifier to uniquely identify the newly created Policy Template. In that case, it shall respond with a 201 (Created) HTTP response message and provide the URL to the newly created resource in the Location header field.

The default state of a newly created Policy Template is pending. When all mandatory property values are provided with the Policy Template creation, the validation is triggered.

### 4.3.7.3 Read Policy Template

This procedure is used by the 5GMS Application Provider and other 5GMSd/5GMSu AFs to query the properties of an existing Policy Template resource from the 5GMSd/5GMSu AF. The HTTP GET method shall be used for this purpose.

If the procedure is successful, the 5GMSd/5GMSu AF shall respond with a 200 (OK) response that includes the Policy Template in the response message body.

### 4.3.7.4 Update Policy Template

The update operation is invoked by the 5GMS Application Provider to modify the properties of an existing Policy Template. All available properties except state may be updated. The HTTP PATCH or HTTP PUT methods shall be used for the update operation.

Any update to the policy template will change the state back into the pending state, which makes it temporarily unusable. The Policy Template validation is automatically triggered, once all mandatory property values are provided.

Editor’s Note: It is FFS, whether ANY update or SOME updates of the Policy Template will trigger a state change to *pending*.

If the procedure is successful, the 5GMSd/5GMSu AF shall respond with a 200 (OK) response message that includes the Policy Template in the response message body. Modifications to read-only properties, such as changes to the state of a Policy Template, shall be rejected with a 403 (Forbidden) HTTP response.

### 4.3.7.5 Delete Policy Template

This operation is used by the 5GMS Application Provider to destroy a Policy Template resource. The HTTP DELETE method shall be used for this purpose. As a result, the 5GMSd/5GMSu AF will remove the Policy Template from any Provisioning Sessions that reference it.

Currently active streaming sessions using the destroyed Policy Template, if any exist, shall be stopped by the removal of the Policy Template.

If the procedure is successful, the 5GMSd/5GMSu AF shall respond with a 200 (OK) response message.

**\*\*\*\* Next Change \*\*\*\***

**\*\*\*\* Next Change \*\*\*\***

## 7.9 Policy Templates Provisioning API

### 7.9.1 Overview

The Policy Templates Provisioning API allows a 5GMS Application Provider to configure a set of Policy Templates within the scope of a Provisioning Session that can subsequently be applied to 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 media streaming sessions. 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 has not yet been validated. It may still be under construction without a full set of parameters. This is the default state after Policy Template creation.

- Ready: After successful validation, the Policy Template is ready to be used.

- Suspended: The 5GMS AF may move a Policy Template into this state under certain conditions specified in a Service Level Agreement.

When a Policy Template is intended to be used to apply differentiated QoS Flows, the QoSSpecification object shall be present.

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

- The maxBtrUl and maxBtrDl parameters define the maximal bit rates which can be used for the QoS Flows.

- The maxAuthBtrUl and MaxAuthBtrDl parameters define the maximal authorized bit rate values which can be requested by a Media Session Handler. Higher bit rate values are not authorized by the ASP.

When a Policy Template is intended to be used for differentiated charging, then ChargingSpecification object shall be present.

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

- The aspId identifies the API invoker.

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

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

### 7.9.2 Resource structure

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

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

Table 7.9.2‑1 below specifies the operations and the corresponding HTTP methods that are supported by this API. In each case, the Provisioning Session identifier shall be substituted into {provisioningSessionId} in the above URL template and the sub-resource path specified in the second column shall be appended to the URL base path.

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

|  |  |  |  |
| --- | --- | --- | --- |
| Operation | Sub‑resource path | Allowed HTTP method(s) | Description |
| Create a new Policy Template | policy-templates | POST | Used to create a new Policy Template resource. |
| Fetch a Policy Template | policy-templates/‌{policyTemplateId} | GET | Used to retrieve an existing Policy Template resource. |
| Update a Policy Template | PUT,PATCH | Used to modify the configuration of an existing Policy Template. |
| Delete a Policy Template | DELETE | Used to delete an existing Policy Template resource.  |

### 7.9.3 Data model

#### 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 | D | Visibility | Description |
| policyTemplateId | Integer | 1..1 | O |  | Unique identifier of this Policy Template within the scope of the Provisioning Session. |
| state | Enumeration of Strings | 1..1 | O |  | A Policy Template may be in the pending, ready, or suspended state. The 5GMS AF sets the state.Only a Policy Template in the ready state may be instantiated as a Dynamic Policy Instance and applied to streaming sessions. |
| apiEndPoint | String | 1..1 | I | 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 | I | MNO Admin | N5: Npcf Policy Authorization Service.N33: AsSessionWithQoS or CHargableParty. |
| externalReference | String  | 1..1 | I |  | Additional identifier for this Policy Template, unique within the scope of its Provisioning Session, that can be cross-referenced with external metadata about the streaming session. |
| QoSSpecification | Object | 0..1 |  |  | Specifies the network quality of service to be applied to streaming sessions at this Policy Template. |
| qosReference | String | 0..1 | I |  | As defined in clause 5.6.2.7 of TS 29.514 [Z]. |
| maxBtrUl | BitRate | 0..1 | O |  |
| maxBtrDl | BitRate | 0..1 | O |  |
|  maxAuthBtrUl | BitRate | 0..1 | I |  |
|  maxAuthBtrDl | BitRate | 0..1 | I |  |
|  maxPacketLossRateDl | PacketLossRateRm | 0..1 | I |  |
|  maxPacketLossRateUl | PacketLossRateRm | 0..1 | I |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| desMaxLoss | Float | 0..1 | I |  |
| desMaxLatency | Float | 0..1 | I |  |
| ApplicationSessionContext | Object | 1..1 |  |  | Specifies information about the application session context to which this Policy Template can be applied. |
|  afAppId | AfAppId | 0..1 | O | Read-Only | As defined in clause 5.6.2.3 of TS 29.514. |
|  sliceInfo | Snssai | 0..1 | I |  |
|  dnn | Dnn | 0..1 | I |  |
|  aspId | AspId | 1..1 | I |  |
| ChargingSpecification | Object | 0..1 |  |  | Provides information about the charging policy to be used for this Policy Template. |
|  sponId | SponId | 0..1 | I |  | As defined in clause 5.6.2.3 of TS 29.514. |
|  sponStatus | SponsoringStatus | 0..1 | O |  |
|  gpsi | [Gpsi] | 0..\* | I |  | List of UEs permitted to instantiate this Policy Template. |

Editor’s Note: The parameter externalReference is for further study. It may be a provisioning parameter of the Media Player and / or a Media Session Handler to assist mapping of external references to a policyTemplateId.

Editor’s Note: The ChargingSpecification object may contain any charging related information, such as sponId or afChargeId.

**\*\*\*\* next Change \*\*\*\***

## 11.2 Service Access Information API

### 11.2.1 General

### 11.2.2 Resources

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

{apiRoot}/3gpp-m5d/v1/service-access-information/{saiSubresource}

The following operations and the corresponding HTTP methods are supported. In each case, the sub-resource path specified in the second column shall be substituted into {sai-subresource} in the above URI template:

|  |  |  |  |
| --- | --- | --- | --- |
| Operation | Sub-resource path | Allowed HTTP method(s) | Description |
| Fetch Service Access Information | {saiSubresource} | GET | Used to acquire the Service Access Information resource for the specified Provisioning Session. |

### 11.2.3 Data model

#### 11.2.3.1 ServiceAccessInformation resource type

The data model for the ServiceAccessInformtion resource is specified in Table 11.2.3.1-1 below:

Table 11.2.3.1‑1: Definition of ServiceAccessInformation resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Property name | Type | Cardinality | D | Description |
| provisioningSessionId | String | 1..1 | O | Unique identification of the M1d Provisioning Session. |
| StreamingAccess | Object | 0..1 |  |  |
| mediaPlayerEntry | URL String | 1..1 | O | A document or a pointer to a document that defines a media presentation e.g. MPD for DASH content or URL to a video clip file. |
|  |  |  |  |  |
| ClientConsumptionReportingConfiguration | Object | 0..1 |  |  |
| reportingInterval | DurationSec | 0..1 | O | The time interval, expressed in seconds, between consumption report messages being sent by the Media Session Handler. The value shall be greater than zero.When this property is omitted, a single final report shall be sent immediately after the streaming session has ended. |
| serverAddresses | Array(URL String) | 1..1 | O | A list of 5GMSd AF addresses (URLs) where the consumption reporting messages are sent by the Media Session Handler.(Opaque URL, following the 5GMS URL format.) |
| locationReporting | Boolean | 1..1 | O | Stipulates whether the Media Session Handler is required to provide location data to the 5GMSd AF in consumption reporting messages (in case of MNO or trusted third parties). |
| samplePercentage | Percentage | 1..1 | O | The percentage of streaming sessions that shall send consumption reports, expressed as a floating point value between 0.0 and 100.0. |
| DynamicPolicyInvocationConfiguration | Object | 0..1 |  |  |
| serverAddresses | Array(URL String) | 1..N | O | A list of 5GMSd AF addresses (URLs) which offer the APIs for dynamic policy invocation sent by the Media Session Handler.(Opaque URL, following the 5GMS URL format.) |
| validPolicyTemplateIds | Array(String) | 1..N | O | A list of Policy Template identifiers which the 5GMSd Client is authorized to use. |
| sdfMethods | Array(String) | 1..N | O | 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. |
| externalReference | String | 0..1 | O | Additional identifier for this Policy Template, unique within the scope of its Provisioning Session, that can be cross-referenced with external metadata about the streaming session.Example: “HD\_Premium”. |
| ClientMetricsReportingConfiguration | Object | 0..1 |  |  |
| serverAddresses | Array(URL String) | 1..N | O | A list of 5GMSd AF addresses to which metrics reports shall be sent.(Opaque URL, following the 5GMS URL format.) |
| dataNetworkName | String | 0..1 | O | 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 | O | The time interval, expressed in seconds, between metrics reports being sent by the Media Session Handler. The value shall be greater than zero.When this property is omitted, a single final report shall be sent immediately after the streaming session has ended. |
| samplePercentage | Percentage | 1..1 | O | The percentage of streaming sessions that shall report metrics, expressed as a floating point value between 0.0 and 100.0. |
| urlFilters | Array(String) | 1..N | O | A 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..N | O | A list of metrics which shall be reported. |

### 11.2.4 Operations

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

\*\*\*\* Next Change \*\*\*\*

## 11.5 Dynamic Policies API

### 11.5.1 Overview

The Dynamic Policies API allows the Media Session Handler to request a specific policy and charging treatment to be applied to a particular application data flow by invoking RESTful operations on the 5GMSd AF at interface M5d. The API defines a set of data models, resources and the related procedures for the creation and management of the dynamic policy request. The corresponding JSON schema for the representation of the resources and operations defined by the API is provided in Annex ZZ.

### 11.5.2 Resource structure

#### 11.5.2.1 General

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

{apiRoot}/3gpp-dynamicpolicies/v1/

Table 11.5.3.1‑1 below specifies the operations and the corresponding HTTP methods that are supported by this API. The sub-resource path specified in the second column shall be appended to the URL base path.

Table 11.5.3.1-1: Resources and methods overview

|  |  |  |  |
| --- | --- | --- | --- |
| Resource name | Sub-resource path | Allowed HTTP methods | Description |
| Dynamic Policies | policies | GET | Forbidden. The 5GMSd AF shall return an error code. |
| POST | Create a new Dynamic Policy resource. |
| Dynamic Policy  | policies/{policyId} | GET | Read a Dynamic Policy resource |
| PUT | Replace an existing Dynamic Policy resource. |
| PATCH | Modify an existing Dynamic Policy resource. |
| DELETE | Delete an existing Dynamic Policy resource. |

### 11.5.3 Data model

#### 11.5.3.1 DynamicPolicy resource type

Table 11.5.2.1-1: Definition of Dynamic Policy resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute name | Data type | Cardinality | D | Description |
| policyTemplateId | String | 1 | I | Identifies the Policy Template which should be applied to the application flow(s). |
| ServiceDataFlowTemplate | Object | 1..1 | I |  |
| flowDescription | Object | 0..1 | I | Refer to clause 5.3.8 of TS 29.214 [Y] for encoding. |
| tosTrCl | TosTrafficClass | 0..1 | I | Type of Service or Traffic Class as defined in TS 29.514 [Z] clause 5.6.3.2. |
| domainName | DNType | 0..1 | I |  |
| provisioningSessionId | String | 1 | I | Uniquely identifies a Provisioning Session representing the 5GMS Application Provider. |
| bitRates | Object | 0..1 |  |  |
| marBwDlBitRate | BitRate | 1..1 | I | Maximum requested bit rate for the Downlink. |
| marBwUlBitRate | BitRate | 1..1 | I | Maximum requested bit rate for the Uplink. |
| minDesBwDlBitRate | BitRate | 0..1 | I | Minimum desired bandwidth for the Downlink. |
| minDesBwUlBitRate | BitRate | 0..1 | I | Minimum desired bandwidth for the Uplink. |
| mirBwDlBitRate | BitRate | 1..1 | I | Minimum requested bandwidth for the Downlink. |
| mirBwUlBitRate | BitRate | 1..1 | I | Minimum requested bandwidth for the Uplink. |
| enforcementMethod | String | 0..1 | O | Description of the Policy Enforcement Method. The parameter is set by the 5GMSd AF. |
| enforcementBitRate | Integer | 0..1 | O | Description of the enforcement bit rate. |

### 11.5.4 Operations

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

The Dynamic Policy resource contains a ServiceDataFlowTemplate object, which contains the service data flow template according to TS 23.503. The 5G System identifies the application flows using the Service Data Flow Template. The ServiceDataFlowTemplate object shall contain one of:

- a flowDescription Object,

- an object of type TosTrafficClass, or

- a domainDame

When the Media Session Handler activate a QoS related Dynamic Policy Template, then the bitrates object shall be present and contain the following properties

- marBwDlBitRate and marBwUlBitRate, indicating the actual requested bitrate.

- mirDwDlBitRate and mirBwUlBitRate, indicating the absolut minimal usable bitrate.

- minDesBwDlBitRate and minDesBwUlBitrate, indicating the desired lower bitrate.

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

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

- an enforcementBitrate property, indicating the maximal bitrate.

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
|  |  |  |  |
|  |  |
|  |  |  |  |
|  |  |
|  |  |
|  |  |

|  |  |
| --- | --- |
|  |  |
|  |  |
|  |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
|  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
|  |  |  |
|  |  |  |  |  |
|  |  |  |  |
|  |

|  |  |
| --- | --- |
|  |  |
|  |  |
|  |  |
|  |  |

\*\*\*\* Next Change \*\*\*\*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
|  |  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

\*\*\*\* End of Changes \*\*\*\*