**3GPP TSG-SA4 Meeting # *94***

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
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|  | **512** | **CR** |  | **rev** | **0045** | **Current version:** | **5.0** |  |
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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:***  | CR on Background Data Transfer in 5GMS |
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| ***Source to WG:*** | Qualcomm Inc. |
| ***Source to TSG:*** | S4 |
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| ***Work item code:*** | 5GMS\_Pro\_Ph2 |  | ***Date:*** | 15-08-2023 |
|  |  |  |  |  |
| ***Category:*** |  |  | ***Release:*** | Rel-18 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories 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-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
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| ***Reason for change:*** | The usage of Background Data Transfer (BDT) in 5GMS has been studied in TR26.804. This CR introduces the feature of BDT into 5GMS, to enable application providers to provision its usage and clients to benefit from it. |
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| ***Summary of change:*** | The change adds the capability to provision BDT in the M1 procedures, inform the MSH about the availability of BDT, and enable applications to make use of it over the M6 interface. |
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| ***Consequences if not approved:*** | BDT will not be supported in 5GMS. |
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| ***Clauses affected:*** | 6.4.3.9, 6.4.3.10, 7.9.1, 7.9.3.1, 11.5.3.1, 11.5.4, 12.2.4 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
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| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

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| **1st Change** |

#### 6.4.3.9 M1BDTSpecification type

Table 6.4.3.9-1: Definition of M1BDTSpecification type

| Property name | Type | Cardinality | Description |
| --- | --- | --- | --- |
| bdtPolicyId | BdtReferenceId | 0..1 | If a BDT policy already exists, the policy identifier. The BdtReferenceId is defined in TS29.154. |
| desTimeInt | TimeWindow | 0..1 | The desired time window for the first activation of the BDT policy. |
| periodicity | Periodicity | 0..1 | The periodicity of the BDT policy. All repetitions have the same start and end time but a different date. |
| numOfUes | integer | 0..1 | The expected number of UEs that will use the BDT policy. |
| volPerUe | UsageThreshold | 0..1 | The expected usage threshold per UE when applying this BDT policy. |
| NOTE: Either bdtPolicyId is present or all other properties are present. In the latter case, the 5GMS AF will attempt to create a new BDT policy using the BDTPolicyControl\_Create procedure as defined in TS29.554. |

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| **2nd Change** |

#### 6.4.3.9 M5BDTSpecification type

Table 6.4.3.9-1: Definition of M5BDTSpecification type

| Property name | Type | Cardinality | Description |
| --- | --- | --- | --- |
| recTimeInt | TimeWindow | 1 | Indicates the recommended time interval for using the BDT policy. |
| periodicity | Periodicity | 0..1 | The periodicity of the BDT window. All repetitions have the same start and end time but a different date. |
| maxBitRateDl | Bitrate | 0..1 | The maximum BDT bitrate in the downlink direction authorized for this UE. |
| maxBitrateUl | Bitrate | 0..1 | The maximum BDT bitrate in the uplink direction authorized for this UE. |
| estimatedVolume | UsageThreshold | 0..1 | The estimated data traffic that the UE is expected to use during the current time window. This value is provided by the MSH to the 5GMS AF. |

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| **3rd 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.

The 5GMS Application Provider may request the provisioning of Background Data Transfer for its downlink and uplink streaming sessions. To create a new BDT Policy, the request shall at least include:

* The *desTimeInt* indicates the desired time window over which the quotas for BDT are calculated.
* The *periodicity* indicates the expected periodicity over which the desired BDT is to be used.
* The *numOfUes* that indicates the expected number of Ues to make use of the BDT policy.
* The *volPerUe* that reflects the expected BDT data volume used by each UE over a given time window (desTimeInt).

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| **4th 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. |
| stateReason | Problem‌Details | 1..1 | C: ROR: ROU: – |  | Additional details about the current state of this Policy Template exposed to the 5GMS Application Provider by the 5GMS AF.The instance sub-property shall be present and shall indicate the URL of this Policy Template resource.The title sub-property shall be present and shall indicate a human-readable representation of the state property specified above, e.g. "Policy Template ready for use" or "Policy Template invalid".The detail sub-property shall be present and shall indicate a human-readable status/error message.All other properties shall be omitted. |
| 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 direct 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. |
| bdtSpecification | M1BDTSpecification | 0..1 | C: RWR: ROU: RW |  | Specifies the BDT policy to be associated with the media sessions of the application provider. |
| 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. |

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| **5th Change** |

#### 11.5.3.1 DynamicPolicy resource

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

Table 11.5.3.1-1: Definition of Dynamic Policy resource

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| --- | --- | --- | --- | --- |
| Property name | Data type | Cardinality | Usage | Description |
| dynamicPolicyId | ResourceId | 1..1 | RO | Unique identifier for this Dynamic Policy. |
| policyTemplateId | ResourceId | 1..1 | C: RWR: ROU: RW | Identifies the Policy Template which should be applied to the application flow(s). |
| serviceDataFlowDescriptions | Array(ServiceDataFlowDescription) | 1..1 | C: RWR: ROU: RW | Describes the service data flows managed by this Dynamic Policy. |
| provisioningSessionId | ResourceId | 1..1 | C: RWR: ROU: RW | Uniquely identifies Provisioning Session, which is linked to the Application Service Provider. |
| qosSpecification | M5QoSSpecification | 0..1 | C: RWR: ROU: RW | Describes the network Quality of Service properties of this Dynamic Policy. |
| bdtSpecification | M5BDTSpecification | 0..1 | C:RWR: ROU: RW | Describes the BDT traffic limits and time windows allowed for this Dynamic Policy. |
| enforcementMethod | String | 0..1 | C: ROR: ROU: RO | Description of the Policy Enforcement Method. The parameter is set by the 5GMSd AF. |
| enforcementBitRate | Integer | 0..1 | C: ROR: ROU: RO | Description of the enforcement bit rate. |

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| **6th Change** |

### 11.5.4 Operations

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

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

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

- a domainName.

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

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

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

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

When the Media Session Handler activates a BDT Dyanmic Policy Template, the bdtSpecification property shall be present and it shall contain the following properties:

- *estimatedVolume*, indicating the estimated data volume that will be used during the current BDT time window.

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

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

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

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| **7th Change** |

### 12.2.4 Dynamic Policy Information

The Media Session Handler offers the application an API to register for and get notified upon availability of a Background Data Transfer opportunity. The application may also query the next BDT time window and its constraints at any point in time.