**3GPP TSG-SA WG4 Meeting #132S4-250997**

**Japan, Fukuoka, 19 – 23 May 2025 *revision of S4-250512***

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  |  | **CR** |  | **rev** |  | **Current version:** |  |  |
|  | | | | | | | | |
| *For* [***HELP***](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:*** | [5G\_RTP\_Ph2] Enabling RTC support of dynamic traffic characteristics | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Lenovo | | | | | | | | | |
| ***Source to TSG:*** | S4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5G\_RTP\_Ph2 | | | | |  | ***Date:*** | | | 2025-05-13 |
|  |  | | | |  | |  | | |  |
| ***Category:*** |  |  | | | | | ***Release:*** | | | Rel-19 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Lack of support in the RTC media delivery system for data burst size, time to next burst and expedited transfer indication as dynamic traffic characteristics.  The dynamic traffic characteristics (i.e., data burst size, time to next burst, expedited transfer indication) and associated procedures have been defined in Rel-19 of TS 23.501 as downlink enhancements to support XR media services. Furthermore, TS 26.522 has defined RTP header extensions to transport in user plane at N6 the dynamic traffic characteristics signals originating at the media AS (e.g., Burst Size, BSize, time to next burst, TTNB, and expedited transfer indication, ETI). Yet, TS 26.510 lacks currently RTC media delivery interactions and APIs details/enablers for configuring these dynamic traffic characteristics features and their corresponding indications as envisioned by Stage-2 procedures and architecture of TS 23.501 | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | - Complemented dynamic policy provisioning with data burst size, time to next burst and expedited transfer indication marking  - Described creation of dynamic policy instance resource when data burst size, time to next burst and expedited transfer indication marking are enabled  - Complemented QosRange data model with data burst size, time to next burst and expedited transfer indication marking  - Added expedited transfer indication to ClientQoSSpecification data model  - Updated with data burst size, time to next burst and expedited transfer indication marking to the Maf\_SessionHandling service access information resource  - Updated with dynamic traffic characteristics the dynamic policy resource of the Maf\_SessionHandling service  - Added informative details on Media AF mapping of dynamic traffic characteristics features to PCF Npcf\_PolicyAuthrozation APIs. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Lack of support for dynamic traffic characteristics for RTC media delivery in Stage-3 specification of the generic media delivery system. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.2.7.1, 5.3.3.2, 7.3.3.2, 7.3.3.4, 7.3.3.6, 9.2.3.1, 9.3.3.1, Annex D.1.2, Annex D.1.3 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **X** |  | Other core specifications | | | | TS 26.113 CR 0008rev1 | | |
| ***affected:*** | |  |  | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  |  | O&M Specifications | | | | TS/TR ... CR ... | | |
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| ***Other comments:*** | | OpenAPI YAML prototyping and changes will be performed at <https://forge.3gpp.org/rep/sa4/amd-pro-med> once a stable version of this document has been endorsed. A delta of the changes will be made available with the final CR for agreement. | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | Rev1:  - Updated clauses 7.3.3.2 and 9.3.3.1 to include details of dynamic traffic characteristics for ApplicationFlowDescription type and Dynamic Policy resource  - Integrated offline comments and editorial changes post SA4#131-bis-e  - Expanded Annex D.1.2, D.1.3 with mapping of dynamic traffic characteristics to the PCF Npf\_PolicyAuthorization service | | | | | | | | |

\* \* \* \* First change \* \* \* \*

### 5.2.7 Dynamic Policy provisioning

#### 5.2.7.1 General

These operations are used by the Media Application Provider to configure Policy Templates for the media delivery sessions of a particular Provisioning Session.

A Policy Template, identified by its policyTemplateId, represents a set of PCF/NEF API parameters which defines the service quality and/or associated charging for the corresponding media delivery session(s). The Policy Template is configured as part of the provisioning procedures with the Media AF using the API specified in clause 8.7 and is subsequently instantiated by a Media Session Handler or Media AS (whichever is acting as Dynamic Policy invoker) using the interactions specified in clause 5.3.3.

When a Policy Template requires media to be delivered in a specific Data Network and/or network slice at reference point M4, the applicationSessionContext array shall be present with at least one of the following properties populated:

- The dnn property contains the name of the Data Network in which the Media AS is hosted.

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

When a Policy Template is intended to influence the network QoS of Service Data Flows used for media delivery, the qoSSpecifications array shall be populated with objects of type QosRange (see clause 7.3.3.4). Each member of the array describes the QoS limits of an application service component that a Media Client is permitted to request when instantiating the Policy Template:

- The componentReference property is a string used by the Dynamic Policy invoker to reference this QosRange when instantiating the Policy Template. It shall be unique for all members of the same qoSSpecifications array.

- The qosReference value, as specified in clause 5.6.2.7 of TS 29.514 [18], is obtained with the Service Level Agreement. See TS 23.502 [3] for detailed usage.

- The maximumBitRate properties of the downlinkQosSpecification and uplinkQosSpecification objects define the maximal bit rates which are permitted to be requested by a Dynamic Policy invoker on (respectively) downlink and uplink Service Data Flows. These values are defined by configuration of the 5G System and are therefore populated by the Media AF rather than by the Media Application Provider.

- The maximumAuthorisedBitRate properties of the downlinkQosSpecification and uplinkQosSpecification objects define the maximal bit rates which a Dynamic Policy invoker is authorised to request on (respectively) downlink and uplink Service Data Flows. Higher bit rates are not authorised by the Media Application Provider when the Policy Template is instantiated.

- The minimumPacketLossRate properties of the downlinkQosSpecification and uplinkQosSpecification objects define the minimal packet loss rates which are permitted to be requested by a Dynamic Policy invoker on (respectively) downlink and uplink Service Data Flows. Lower packet loss rates are not permitted by the Media Application Provider when the Policy Template is instantiated.

- The pduSetQosLimits properties of the downlinkQosSpecification and uplinkQosSpecification objects define the minimal delay budget and minimal error rates for PDU Sets which are permitted to be requested by a Dynamic Policy invoker on (respectively) downlink and uplink Service Data Flows. Lower delay and error rates are not permitted by the Media Application Provider when the Policy Template is instantiated.

- The pduSetMarking flag is used to specify whether Media Clients instantiating this Policy Template for uplink media delivery, or Media AS instances for downlink media delivery, are required to apply PDU Set marking to media transport protocol PDUs falling within the scope of a Dynamic Policy Instance based on this Policy Template.

NOTE 1: PDU Set marking is used by the 5G System to satisfy the QoS requirements of application flows.

- The downlinkDataBurstSizeMarking flag is used to specify whether the Media AS is required to apply data burst size marking to downlink PDUs falling within the scope of a Dynamic Policy Instance based on this Policy Template.

- The downlinkTimeToNextBurstMarking flag is used to specify whether the Media AS is required to apply time to next burst marking to downlink PDUs falling within the scope of a Dynamic Policy Instance based on this Policy Template.

- The downlinkExpeditedTransferIndicationMarkingflag is used to specify whether the Dynamic Policy invoker (Media Client or the Media AS) is allowed to configure different QoS requirements for expedited and non-expedited PDU delivery, and whether the Media AS is required to apply expedited transfer indication marking to downlink PDUs falling within the scope of a Dynamic Policy Instance based on this Policy Template.

NOTE 1a: Data burst marking, time to next burst marking and expedited transfer marking are used by the 5G System as dynamic traffic characteristics, as defined in clause 5.37.10 of TS 23.501 [2], to satisfy the QoS requirements of application flows.

NOTE 1b: Expedited transfer indication marking is applicable only when a UE hosting a Media Client supports reflective QoS, as defined in clause 6.1.3.27.9 of TS 23.503 [17].

When a Policy Template is intended to be used for differential charging, the chargingSpecification property shall be present.

When a Policy Template is intended to be used for Background Data Transfer, the properties of a new Background Data Transfer policy are specified by the Media Application Provider in the bdtSpecification property (of type Bdt‌Policy‌Schedule).

- The startDate and endDate indicate the time period for which the Background Data Transfer specification is valid. A Background Data Transfer specification may be removed from its parent Policy Template by the Media AF when it expires.

- The windows property indicates the time windows over which the Background Data Transfer may occur.

- Each such time window is characterised by a start time (startTime), a duration (duration) and the days of the week on which the time window is scheduled (daysOfWeek).

- The numberOfUes property indicates the maximum number of UEs permitted to instantiate the Policy Template and make use of Background Data Transfers during a single time window instance.

- The estimatedDataVolumePerUe that reflects the average data volume that each UE is expected to transfer during a single time window instance.

NOTE 2: The product of the numberOfUes and estimatedDataVolumePerUe properties represents an estimate of the maximum data volume that may be transferred during any given time window instance.

- The aggregate‌Uplink‌BitRate‌Limit and aggregate‌DownlinkBitRate‌Limit properties specify limits on the total aggregate bit rate of all currently instantiated Policy Templates to be enforced by the Media AF's admission control function. If omitted, the Media AF may instantiate a Policy Template with a Background Data Transfer specification regardless of additional costs that may be incurred by the Media Application Provider as a result.

HTTP responses for successful and operation-specific failure cases are specified in the following clauses. For all other failure cases, an HTTP response indicating a response code in accordance with clause 7.1.6 shall be returned to the API client. In all failure cases a message body in accordance with clause 7.1.7 shall be included in the response message.

\* \* \* \* Next change \* \* \* \*

#### 5.3.3.2 Create Dynamic Policy Instance resource operation

In order to instantiate a new dynamic policy, the Media Session Handler or Media AS (whichever is acting as Dynamic Policy invoker) shall first create a resource for the Dynamic Policy Instance in the Media AF. The Dynamic Policy invoker shall use the HTTP POST message for this purpose. The body of the HTTP POST message shall be a Dynamic Policy Instance resource representation that includes a Provisioning Session identifier, the resource identifier of the target Policy Template and a set of Service Data Flow descriptions identifying the application flow(s) to be policed.

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

2. The policyTemplateId property uniquely identifies the Policy Template on which the Dynamic Policy Instance is based.

3. For each application flow to be managed by the Dynamic Policy Instance resource, an instance of the Application‌Flow‌Binding object shall be present in the appplication‌Flow‌Bindings array. The applicationFlow‌Description property of this object shall be populated by the Dynamic Policy invoker and shall declare a Service Data Flow template according to TS 23.503 [17] that describes application flow in question. Exactly one of the following filtering specifications shall be populated in the Application‌FlowDescription object to identify traffic belonging to a media delivery application flow:

- a packetFilter object (including 5-tuples, Type of Service, Security Parameter Index, etc.). A Media Client shall not attempt to instantiate more than one Dynamic Policy Instance at the same time that cites the same set of packet filters*.*

- a domainName populated with the fully-qualified Internet domain name of a Media AS at reference point M4*.* A Media Client shall not attempt to instantiate more than one Dynamic Policy Instance at the same time that cites the same domainName*.*

In addition, the top-level media type of the application flow may be declared in the mediaType property.

When the policy binding for the chosen Policy Template indicates that PDU Set marking is enabled (i.e., the pduSetMarking flag is set to true in Service Access Information), the Dynamic Policy invoker shall also populate the mediaTransportParameters property with the media transport protocol parameters to be used by the Media Access Function on the application flow in question to label uplink PDUs belonging to the same PDU Set and/or to indicate the last PDU in each PDU Set and/or to indicate the end of a data burst comprising one or more PDU Sets.

When the policy binding for the chosen Policy Template indicates that PDU Set marking is enabled (i.e., the pduSetMarking flag is set to true in Service Access Information), the Dynamic Policy invoker shall also populate the mediaTransportParameters property with the media transport protocol parameters to be used by the Media AS on the application flow in question to label downlink PDUs belonging to the same PDU Set and/or to indicate the last PDU in each PDU Set and/or to indicate the end of a data burst comprising one or more PDU Sets.

When the policy binding for the chosen Policy Template indicates that data burst size marking is enabled (i.e., downlinkDataBurstSizeMarking is set to *true* in Service Access Information), the Dynamic Policy invoker shall also populate the mediaTransportParameters property with the media transport protocol parameters to be used by the Media AS on the application flow in question to label downlink PDUs belonging to the same data burst with the predicted size of that data burst.

When the policy binding for the chosen Policy Template indicates that time to next burst marking is enabled (i.e., downlinkTimeToNextBurstMarking is set to *true* in Service Access Information), the Dynamic Policy invoker shall also populate the mediaTransportParameters property with the media transport protocol parameters to be used by the Media AS on the application flow in question to label downlink PDUs belonging to the same data burst with the predicted time to the next burst.

When the policy binding for the chosen Policy Template indicates that expedited transfer indication marking is enabled (i.e., downlinkExpeditedTransferIndicationMarking is set to *true* in Service Access Information), the Dynamic Policy invoker shall also populate the mediaTransportParameters property with the media transport protocol parameters to be used by the Media AS on the application flow in question to label downlink PDUs belonging to the same data burst with the expedited transfer indication.

When the policy binding for the chosen Policy Template indicates that expedited transfer indication marking is enabled (i.e., downlinkExpeditedTransferIndicationMarking is set to *true* in Service Access Information), the Dynamic Policy invoker shall also populate two Application‌Flow‌Binding objects in the application‌Flow‌Bindings array, one with the downlinkExpeditedTransferIndication set to true and the other with this property set to false. The remainder of application‌Flow‌Description properties of the two Application‌Flow‌Binding objects shall be populated identically and shall declare the same Service Data Flow template describing the same application flow for which expedited transfer indication marking is sometimes desired.

4. When the Dynamic Policy invoker attempts to activate a QoS-related Policy Template, the qosSpecification property shall also be present in the Application‌Flow‌Binding object containing the following properties specified in clause 7.3.3.6 to describe the Media Client’s QoS requirements for media application flows described by the bound applicationFlowDescription property:

- downlinkBitRates shall indicate the maximum requested bit rate, minimum desired bit rate and minimum requested bit rate in the downlink direction.

- uplinkBitRates shall indicate the maximum requested bit rate, minimum desired bit rate and minimum requested bit rate in the uplink direction.

- desiredPacketLatency may indicate the desired packet latency in both the downlink and uplink directions.

- desiredPacketLossRate may indicate the desired packet loss rate in both the downlink and uplink directions.

- desiredDownlinkPduSetQosParameters may be populated to indicate the desired delay budget and error rate for PDU Sets in the downlink direction, as well as indicating whether the loss of a single PDU in a PDU Set is significant for the receiving application.

- desiredUplinkPduSetQosParameters may be populated to indicate the desired delay budget and error rate for PDU Sets in the uplink direction, as well as indicating whether the loss of a single PDU in a PDU Set is significant for the receiving application.

- downlinkExpeditedTransferIndication may be populated and shall be set to true for QoS requirements that apply to application flows requiring expedited transfer in both uplink and downlink directions from the network. When downlinkExpeditedTransferIndication is set to true, the *downlinkBitRates* and *uplinkBitRates* properties shall be populated alike. If downlinkExpeditedTransferIndication is omitted or set to false, the QoS requirements apply to non-expedited transfer.

5. When the Dynamic Policy invoker instantiates a Policy Template that is provisioned with a Background Data Transfer (BDT) specification per clause 5.2.7.1, the bdtSpecification property shall be present and it shall contain the following properties:

- estimatedDataTransferVolume, indicating the data volume that the Media Client estimates it will use during the current Background Data Transfer time window.

- Each object (see clause 7.3.3.14) conveyed in the windows array indicates a time window over which Background Data Transfers are requested by the Dynamic Policy invoker from those offered in the dynamic policy configuration of the Service Access Information resource (see clause 5.3.2.1).

- Each such window may additionally indicate the maximum bit rate for Background Data Transfers in the downlink and uplink directions that the Dynamic Policy invoker is bidding for in (respectively) the maximimumDownlinkBitRate and maximimumUplinkBitRate properties. In response, the Media AF populates these properties with the maximum permitted bit rate for Background Data Transfers in the downlink and uplink directions respectively when the dynamic policy is in force.

6. When the 5G System employs a traffic enforcement function to ensure that traffic complies with the policy described by the qosSpecification property, the Media AF shall explicitly indicate this in the Dynamic Policy resource representation by setting the qosEnforcement property to true.

If the operation is successful, the Media AF shall create a new Dynamic Policy Instance resource. In this case, the Media AF shall return a 201 (Created) HTTP response message to the Dynamic Policy invoker, and the URL of the newly created Dynamic Policy Instance resource, including its resource identifier, shall be provided as the value of the Location HTTP header field. The response message body shall be a representation of the current state of the Dynamic Policy Instance resource (see clause 9.3.3.1), including any properties assigned by the Media AF.

Upon successful creation of the Dynamic Policy Instance resource, notifications of updates to the resource may be notified asynchronously to the Dynamic Policy invoker:

- If the notificationURL property is present in the Service Access Information, the Dynamic Policy invoker shall subscribe to the MQTT sub-topic corresponding to the resourceId of the Dynamic Policy Instance and shall expect to receive asynchronous notifications published by the Media AF on the MQTT notification channel of type NOTIFICATION\_‌DYNAMIC\_‌POLICY\_‌INSTANCE concerning changes to the Dynamic Policy Instance, including details about new Background Data Transfer opportunities.

- The Media AF shall use the MQTT notification channel signalled in the Service Access Information (if any, see clause 5.3.2.3) to notify the Dynamic Policy invoker subscriber about updates to the Dynamic Policy Instance resource. A notification message of type NOTIFICATION\_‌DYNAMIC\_‌POLICY\_‌INSTANCE shall be published to the MQTT sub-topic corresponding to the resourceId of the Dynamic Policy Instance.

The usage and message formats for the MQTT notification channel are specified in clause 10.2.

When the Dynamic Policy Instance is successfully instantiated, the Media AF triggers the creation of a corresponding PCC rule in the 5G System according to clause 5.5.3 to enforce the required QoS and/or charging policy on the specified application flow(s). Depending on the ApplicationFlowDescription objects in the received Dynamic Policy Instance resource representation and the filterMethod indicated by each one, the Media AF shall populate for each one a flowDescription object and/or provide an Application Identifier referring to a PFD (Packet Flow Description) object containing the domain name of a Media AS instance.

NOTE: When the Media AF is deployed in an external Data Network, it is the responsibility of the NEF to map any external Application Identifier supplied by the Media AF into an internal Application Identifier that is known to the PCF.

If the supplied Dynamic Policy Instance is not acceptable to the Media AF, the create operation shall fail with an HTTP response status code of 400 (Bad Request) and an error message body per clause 7.1.7. In this case, the Dynamic Policy Instance resource shall remain in an uncreated state in the Media AF.

If the request is acceptable but the Media AF forbids the instantiation of the referenced Policy Template, for example because the quota for Background Data Transfers has been exceeded or because the UE is not permitted in the charging specification, the create operation shall fail with an HTTP response status code of 403 (Forbidden) and an error message body per clause 7.1.7. In this case, the Dynamic Policy Instance resource shall remain in an uncreated state in the Media AF.

If the request is acceptable but the Media AF is unable to provision the resources required by the supplied Dynamic Policy Instance, the create operation shall fail with an HTTP response status code of 500 (Internal Server Error) and an error message body per clause 7.1.7. In this case, the Dynamic Policy Instance resource shall remain in an uncreated state in the Media AF.

If the Dynamic Policy invoker needs to instantiate several dynamic policies, it may invoke this operation as often as needed.

\* \* \* \* Next change\* \* \* \*

#### 7.3.3.2 ApplicationFlowDescription type

This data type is used to declare the properties of an application data flow to the Media AF during the course of a media delivery session. Its properties are used to describe a Service Data Flow to the 5G Core for the purpose of application traffic detection.

Table 7.3.3.2-1: Definition of type ApplicationFlowDescription

|  |  |  |  |
| --- | --- | --- | --- |
| Property name | Data type | Cardinality | Description |
| filterMethod | SdfMethod | 1..1 | The filtering method used to identify packets belonging to this application flow (see clause 7.3.4.2). |
| packetFilter | IpPacketFilterSet | 0..1 | Description of the application flow in terms of packet header field values (see below). |
| domainName | string | 0..1 | Description of the application flow in terms of the Fully-Qualified Domain Name (FQDN) of the Media AS targeted at reference point M4 (see below). |
| mediaType | MediaType | 0..1 | The type of media carried by this application flow (see NOTE 1). |
| mediaTransport‌Parameters | Protocol‌Description | 0..1 | The set of media transport protocol parameters to be used by the 5G Core for the purpose of PDU Set identification and end of data burst detection, and/or dynamically changing traffic characteristics indications on this application flow (see NOTE 2). |
| NOTE 1: Enumeration MediaType is specified in clause 5.6.3.3 of TS 29.514 [18].  NOTE 2: Data type ProtocolDescription is specified in clause 5.5.4.13 of TS 29.571 [33]. | | | |

Exactly one of the following properties shall be populated: packetFilter, domainName.

\* \* \* \* Next change\* \* \* \*

#### 7.3.3.4 QosRange type

This data type is used to specify permitted ranges of QoS parameters and/or to mandate the use of certain QoS features of the 5G System.

Table 7.3.3.4-1: Definition of type QosRange

|  |  |  |  |
| --- | --- | --- | --- |
| Property name | Data type | Cardinality | Description |
| component‌Reference | string | 1..1 | A unique string identifying this QoS specification within the scope of its parent. |
| qosReference | string | 0..1 | As specified in clause 5.6.2.7 of TS 29.514 [18]. |
| downlink‌Qos‌Specification | Unidirectional‌Qos‌Specification | 0..1 | QoS specification in the downlink direction (see below and clause 7.3.3.3). |
| uplink‌Qos‌Specification | Unidirectional‌Qos‌Specification | 0..1 | QoS specification in the uplink direction (see below and clause 7.3.3.3). |
| pdu‌Set‌Marking | boolean | 0..1 | Indicates that packets at reference point M4 are required to include PDU Set marking if the media transport protocol supports this.  Default value false if omitted. |
| downlink‌Data‌Burst‌Size‌Marking | boolean | 0..1 | Indicates that downlink packets at reference point M4 are required to include data burst size marking if the media transport protocol supports this.  Default value *false* if omitted. |
| downlink‌Time‌To‌Next‌Burst‌Marking | boolean | 0..1 | Indicates that downlink packets at reference point M4 are required to include time to next burst marking if the media transport protocol supports this.  Default value *false* if omitted. |
| downlink‌Expedited‌Transfer‌Indication‌Marking | boolean | 0..1 | Indicates that downlink packets at reference point M4 are required to include expedited transfer indication marking if the media transport protocol supports this.  Default value *false* if omitted. |

At least one of the following properties shall be populated: qosReference, downlink‌Qos‌Specification, uplink‌Qos‌Specification.

\* \* \* \* Next change \* \* \* \*

#### 7.3.3.6 ClientQosSpecification type

Table 7.3.3.6-1: Definition of type ClientQosSpecification

|  |  |  |  |
| --- | --- | --- | --- |
| Property name | Data type | Cardinality | Description |
| downlinkBitRates | Unidirectional‌Bit‌Rate‌Specification | 1..1 | Bit rate specification for the downlink direction (see clause 7.3.3.5). |
| uplinkBitRates | Unidirectional‌Bit‌Rate‌Specification | 1..1 | Bit rate specification for the uplink direction (see clause 7.3.3.5). |
| desiredPacketLatency | number | 0..1 | Desired packet latency in milliseconds, expressed as a positive floating-point value (see NOTE 1). |
| desiredPacketLossRate | Packet‌Loss‌Rate | 0..1 | Desired packet loss rate expressed in tenths of a percent (see NOTE 1). |
| desiredDownlinkPduSetQosParameters | PDUSet‌Qos‌Para | 0..1 | Desired PDU Set QoS parameters for the downlink direction (see NOTE 2). |
| desiredUplinkPduSetQosParameters | PDUSet‌Qos‌Para | 0..1 | Desired PDU Set QoS parameters for the uplink direction (see NOTE 2). |
| downlink‌Expedited‌Transfer‌Indication | boolean | 0..1 | Indicates whether (true) or not (false) this object applies to application data flows whose transport is to be expedited by the network.  Default value is *false* if omitted.  If set to *true* the *downlinkBitRates* and *uplinkBitRates* shall be set to the same values. |
| NOTE 1: Clause 5.6.2.7 of TS 29.514 [18] restricts packet latency and packet loss to be the same in the downlink and uplink directions for a given MediaComponent when the CHEM feature is not supported by the PCF.  NOTE 2: Data type PDUSetQosPara is specified in clause 5.5.4.11 of TS 29.571 [33]. | | | |

\* \* \* \* Next change \* \* \* \*

#### 9.2.3.1 ServiceAccessInformation resource type

The data model for the ServiceAccessInformation resource is specified in table 9.2.3.1-1 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 9.2.3.1‑1: Definition of ServiceAccessInformation resource

| Property name | | | Type | Cardinality | Description | Applicability |
| --- | --- | --- | --- | --- | --- | --- |
| provisioningSessionId | | | ResourceId | 1..1 | Unique identification of the M1 Provisioning Session. | All types |
| provisioningSession‌Type | | | Provisioning‌Session‌Type | 1..1 | The type of Provisioning Session. | All types. |
| locationReporting | | | boolean | 1..1 | If true, the Media Session Handler or Media AS is required to provide UE location data in Dynamic Policy interactions (see clause 9.3.3.1), Network Assistance interactions (see clause 9.4.3.1), QoE metrics reporting interactions (see clause 9.5.3) and consumption reporting interactions (see clause 9.6.3.2).  Shall be set *false* if the locationReporting parameter is omitted from the ProvisioningSession, as specified in table 8.2.3.1‑1. | All types. |
| notificationURL | | | AbsoluteURL | 0..1 | A URL to the MQTT channel, nominated by the Media AF, over which notifications are to be sent by the Media AF (see clause 10.2). | All types. |
| streamingAccess | | | object | 0..1 | Present if Content Hosting or Content Publishing is provisioned in the parent Provisioning Session. | MS\_DOWNLINK*,* MS\_UPLINK |
|  | entryPoints | | array(Absolute‌Media‌Entry‌Point) | 0..1 | A list of alternative Media Entry Points for the Media Client to choose between. |
|  |  | locator | AbsoluteUrl | 1..1 | Populated from information in the Content Hosting Configuration or Content Publishing Configuration as specified in clause 8 of TS 26.512 [6].  - For downlink media streaming, either a pointer to a document at reference point M4 that defines a media presentation (e.g. a DASH MPD) whose resources are mapped to a content ingest configuration at reference point M2, or else the URL of a single media resource (e.g. an MP4 asset) available for download at reference point M4 that is mapped to reference point M2 by a Content Hosting Configuration. In both cases, the contentType property shall also be present.  - For uplink media streaming, either a pointer to a document at reference point M4 that defines a media presentation (e.g. a DASH MPD) whose resources are mapped to an egest configuration at reference point M2 (in which case the contentType property shall also be present), or else the URL of a path at reference point M4 the sub-resources of which are mapped to reference point M2 by a Content Publishing Configuration (in which case the protocol property shall also be present). |
|  |  | contentType | string | 1..1 | The MIME content type of resource at locator.  This property shall be mutually exclusive with protocol. |  |
|  |  | protocol | Uri | 1..1 | A fully-qualified term identifier URI that identifies the media delivery protocol at reference point M4 for this Media Entry Point.  This property shall be mutually exclusive with contentType.  The controlled vocabulary of media delivery protocols at this reference point is specified in clause 10 of TS 26.512 [6]. |  |
|  |  | profiles | array(Uri) | 0..1 | An optional list of conformance profile URIs with which this Media Entry Point is compliant.  If present, the array shall contain at least one item. |  |
|  | eMBMS‌Service‌Announcement‌Locator | | AbsoluteUrl | 0..1 | A pointer to an eMBMS User Service Announcement document. |  |
|  | mbs‌External‌Service‌Identifier | | string | 0..1 | The external service identifier of an MBS User Service. |  |
| rtcClientConfiguration | | | object | 0..1 | Present if real-time media communication (RTC) is provisioned. | RTC |
|  | stunEndpoints | | array(Client‌Service‌Endpoint‌Access‌Parameters) | 0..1 | An array of one or more trusted STUN service endpoints for use as ICE candidates. If present, the RTC Client shall use one of the listed servers for RTC-based media delivery sessions within the scope of provisioning‌SessionId.  If the credentials sub-property was not provisioned at reference point M1, the Media AF shall populate this with a set of credentials unique to the requesting Media Client. |
|  | turnEndpoints | | array(Client‌Service‌Endpoint‌Access‌Parameters) | 0..1 | An array of one or more trusted TURN service endpoints for use as ICE candidates. If present, the RTC Client shall use one of the listed servers for RTC-based media delivery sessions within the scope of provisioning‌SessionId.  If the credentials sub-property was not provisioned at reference point M1, the Media AF shall populate this with a set of credentials unique to the requesting Media Client. |
|  | swapEndpoints | | array(Client‌Service‌Endpoint‌Access‌Parameters) | 0..1 | An array of one or more trusted WebRTC Signalling Function service endpoints that support the SWAP protocol. If present, the RTC Client shall use one of the listed servers for RTC-based media delivery sessions within the scope of provisioning‌SessionId.  If the credentials sub-property was not provisioned at reference point M1, the Media AF shall populate this with a set of credentials unique to the requesting Media Client. |
| clientConsumptionReporting‌Configuration | | | object | 0..1 | Present if consumption reporting is activated for this Provisioning Session. | MS\_DOWNLINK*,* RTC |
|  |  | reportingInterval | DurationSec | 0..1 | The time interval, expressed in seconds, between consumption report messages being sent by the consumption reporting entity. 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 | A list of Media AF addresses (URLs) where the consumption reporting messages are sent by the consumption reporting entity. (See NOTE 1).  Each address shall be an opaque base URL, following the format specified in clause 7.1.3 up to and including the {apiVersion} path element. |  |
|  |  | accessReporting | boolean | 1..1 | Indicates whether the consumption reporting entity is required to supply consumption reporting units whenever the access network changes during a media delivery session.  Shall be set *false* if the accessReporting parameter is omitted from the Consumption‌Reporting‌Configuration, as specified in table 8.12.3.1‑1. |  |
|  |  | samplePercentage | Percentage | 1..1 | The percentage of media delivery sessions required to report consumption, expressed as a floating-point value between 0.0 and 100.0.  Shall be set to 100.0 if the samplePercentage parameter is omitted from the Consumption‌Reporting‌Configuration, as specified in table 8.12.3.1‑1. |  |
| dynamicPolicyInvocation‌Configuration | | | object | 0..1 | Present if Policy Templates have been provisioned in the parent Provisioning Session and at least one of them is in the READY state. | MS\_DOWNLINK*,* MS\_UPLINK*,* RTC |
|  | serverAddresses | | array(AbsoluteUrl) | 1..1 | A list of Media AF addresses (URLs) which offer the APIs for dynamic policy invocation. (See NOTE 1.)  Each address shall be an opaque base URL, following the format specified in clause 7.1.3 up to and including the {apiVersion} path element. |  |
|  | policyTemplateBindings | | array(object) | 1..1 | A list of duples, each one binding an external reference to a Policy Template resource identifier. |  |
|  |  | externalReference | string | 1..1 | 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". |  |
|  |  | policyTemplateId | ResourceId | 1..1 | The resource identifier of a Policy Template tagged with externalReference that is in the READY state. |  |
|  |  | pduSetMarking | boolean | 0..1 | If *true*, indicates that PDU Set marking applies to Dynamic Policy Instances based on policyTemplateId.  Default value false if omitted. |  |
|  |  | downlink‌Data‌Burst‌Size‌Marking | boolean | 0..1 | If *true*, indicates that data burst size marking of downlink PDUs is required for Dynamic Policy Instances based on policyTemplateId*.*  Default value *false* if omitted. |  |
|  |  | downlink‌Time‌To‌Next‌Burst‌Marking | boolean | 0..1 | If *true*, indicates that time to next burst marking of downlink PDUs is required for Dynamic Policy Instances based on policyTemplateId*.*  Default value *false* if omitted. |  |
|  |  | downlink‌Expedited‌Transfer‌Indication‌Marking | boolean | 0..1 | If *true,* indicates that expedited transfer indication marking of downlink PDUs is required for Dynamic Policy Instances based on policyTemplateId.  Default value *false* if omitted. |  |
|  |  | bdtWindows | array(BdtWindow) | 0..1 | A list of Background Data Transfer time windows during which the application may request the activation of a Background Data Transfer policy by instantiating the Policy Template identified by policyTemplateId. The actual usage quotas for data volume and bit rate are determined by the Media AF upon instantiation of the Policy Template.  BdtWindow is specified in clause 7.3.3.14. |  |
|  | sdfMethods | | array(SdfMethod) | 1..1 | A list of Service Data Flow description methods, e.g. 5-tuple, TOS, 2-tuple, etc., to be used to describe the application flows at reference point M2 or M12 for media delivery sessions. |  |
| clientMetricsReporting‌Configurations | | | array(object) | 0..1 | Present if QoE metrics reporting is provisioned in the parent Provisioning Session.  If present, contains one or more client metrics reporting configurations. | MS\_DOWNLINK*,* MS\_UPLINK*,* RTC |
|  | metricsReporting‌ConfigurationId | | ResourceId | 1..1 | The identifier of this metrics reporting configuration, unique within the scope of the parent Provisioning Session.  The value shall be the same as the corresponding identifier provisioned at reference point M1 (see clause 8.11.3.1). |
|  | serverAddresses | | array(AbsoluteUrl) | 1..1 | A list of Media AF addresses to which metrics reports shall be sent. (See NOTE 1).  Each address shall be an opaque base URL, following the format specified in clause 7.1.3 up to and including the {apiVersion} path element. |
|  | sliceScope | | array(Snssai) | 0..1 | The set of network slice(s) for which metrics collection and reporting shall be executed in connection with this metrics reporting configuration (see NOTE 2).  If present, the array shall identify at least one network slice.  If absent, metrics shall be collected and reported for media delivery sessions within the scope of the parent Provisioning Session regardless of network slice. |
|  | scheme | | Uri | 1..1 | A URI identifying the metrics scheme that metrics reports shall use (see clause 5.2.11).  The set of QoE metrics schemes valid for use in 5G Media Streaming along with their respective scheme identifiers is specified in clauses 4.7.5 and 7.8.1 of TS 26.512 [6].  The QoE metrics scheme valid for use in RTC along with its respective scheme identifier is specified in clause 15 of TS 26.113 [7]. |
|  | dataNetworkName | | Dnn | 0..1 | The name of the Data Network which shall be used to send metrics reports.  If not specified, the default Data Network shall be used. |
|  | reportingStartOffset | | DurationSec | 0..1 | The time offset (expressed in seconds) from the start of a media delivery session when the metrics reporting entity is required to begin submitting metrics reports.  If omitted, the value of this parameter is assumed to be zero, i.e., directing the Media Client to start reporting metrics from the start of the media delivery session. |
|  | reportingDuration | | DurationSec | 0..1 | The period of time (expressed in seconds) measured relative to the reporting start point, after which the metrics reporting entity is required to stop reporting metrics.  If omitted, reporting is required to continue until the end of the media delivery session. |
|  | reportingInterval | | DurationSec | 0..1 | The time interval, expressed in seconds, between metrics reports being sent by the metrics reporting entity. 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 | The percentage of media delivery sessions required to report QoE metrics, expressed as a floating-point value between 0.0 and 100.0. |
|  | positive‌Crossing‌Thresholds | | map(Uri -> array(Float)) | 0..1 | If present, a non-empty map of QoE metrics to their respective threshold values.  - The index of the associative array shall be the fully-qualified term identifier URI of a metric specified in annex E of TS 26.512 [6] or annex C of TS 26.113 [7].  - The value of each associative array member shall be an array of floating-point threshold values.  A metric in this associative array shall be reported once when its value exceeds one of the associated threshold values, and shall not be reported again until it falls below that threshold and subsequently exceeds it. |
|  | negative‌Crossing‌Thresholds | | map(Uri -> array(Float)) | 0..1 | If present, a non-empty map of QoE metrics to their respective threshold values.  - The index of the associative array shall be the fully-qualified term identifier URI of a metric specified in annex E of TS 26.512 [6] or annex C of TS 26.113 [7].  - The value of each associative array member shall be an array of floating-point threshold values.  A metric in this associative array shall be reported once when its value falls below one of the associated threshold values, and shall not be reported again until it exceeds that threshold and subsequently falls below it. |
|  | location‌Filter | | array(LocationArea5G) | 0..1 | A list of one or more locations (see NOTE 3) where QoE metrics collection is required. When present, a Media Client shall collect metrics only when it is located in these locations and shall report them according to the other properties of the enclosing client metrics reporting configuration.  If omitted, QoE metrics are to be collected and reported regardless of the UE location. |
|  | urlFilters | | array(string) | 0..1 | A non-empty list of Media Entry Point URL patterns for which QoE metrics shall be reported. The format of each pattern shall be a regular expression as specified in [36].  If not specified, reporting shall be done for all media delivery sessions. |
|  | samplingPeriod | | DurationSec | 1..1 | The time interval the Media Client is required to wait between sampling the QoE metrics specified by this metrics reporting configuration. |
|  | metrics | | array(Uri) | 0..1 | A list of one or more QoE metrics, each indicated by a fully-qualified term from a controlled vocabulary, which are to be reported.  If omitted, the complete (or default if applicable) set of metrics associated with the specified scheme shall be collected and reported. |
| networkAssistance‌Configuration | | | object | 0..1 | Present if Network Assistance is provisioned in the parent Provisioning Session. | MS\_DOWNLINK*,* MS\_UPLINK*,* RTC |
|  | serverAddresses | | array(AbsoluteUrl) | 1..1 | A list of Media AF addresses (URLs) that offer the APIs for AF-based Network Assistance at reference point M5. (See NOTE 1.)  Each address shall be an opaque URL, following the format specified in clause 7.1.3 up to and including the {apiVersion} path element. |
| client‌EdgeResources‌Configuration | | | object | 0..1 | Present only for Provisioning Sessions with client-driven edge computing management mode provisioned. | MS\_DOWNLINK*,* MS\_UPLINK*,* RTC |
|  | eligibilityCriteria | | Edge‌Processing‌Eligibility‌Criteria | 0..1 | Conditions for activating edge resources for media delivery sessions in the scope of the parent Provisioning Session. (See clause 7.3.3.10.) |
|  | easDiscoveryTemplate | | EAS‌Discovery‌Template | 1..1 | A template for the EAS discovery filter that shall be used by the EEC to discover and select a Media EAS instance to serve media delivery sessions at reference point M4 in the scope of the parent Provisioning Session. (See clause 9.2.3.3.) |
|  | easRelocation‌Requirements | | Client‌EAS‌Relocation‌Requirements | 0..1 | EAS relocation tolerance and requirements.  If absent, the EEC shall assume that relocation is tolerated by all Media EAS instances in the scope of the parent Provisioning Session. (See clause 9.2.3.4.) |
| NOTE 1: In deployments where multiple instances of the Media AF expose the Media Session Handling APIs at reference point M5, the 5G System may use a suitable mechanism (e.g., HTTP load balancing or DNS-based host name resolution) to direct requests to a suitable Media AF instance.  NOTE 2: The Snssai data type is specified in TS 29.571 [33].  NOTE 3: The LocationArea5G data type is specified in TS 24.558 [14]. | | | | | | |

\* \* \* \* Next change \* \* \* \*

#### 9.3.3.1 DynamicPolicy resource

Table 9.3.3.1-1: Definition of Dynamic Policy Instance resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Property name | | Data type | Cardinality | Usage | Description |
| dynamicPolicyId | | ResourceId | 1..1 | RO | Unique identifier for this Dynamic Policy Instance assigned by the Media AF when the resource is created. |
| provisioningSessionId | | ResourceId | 1..1 | C: RO R: RO U: RO | Uniquely identifies the parent Provisioning Session, which is linked to the Application Service Provider. |
| session‌Id | | MediaDelivery‌SessionId | 1..1 | C: RW R:RO U: RO | Unique identifier of the current media delivery session. |
| policyTemplateId | | ResourceId | 1..1 | C: RW R: RO U: RW | Identifies the Policy Template to be applied to the application flow(s) that fall within the scope of this Dynamic Policy Instance. |
| sliceInfo | | Snssai | 0..1 | C: RW R: RO U: RW | Identifying the target slice in which the Policy Template is instantiated. |
| dataNetworkName | | Dnn | 0..1 | C: RW R: RO U: RW | The name of the target Data Network in which the Policy Template is instantiated. |
| location | | TypedLocation | 0..1 | C: RW R: RO U: RW | The location of the UE when the Dynamic Policy was created or last updated. |
| applicationFlowBindings | | array(Application‌FlowBinding) | 1..1 | C: RW R: RO U: RW | The bindings between application flows at reference point M4 managed within the scope of this Dynamic Policy Instance and their network Quality of Service requirements (see clause 9.3.3.2).  The array shall contain at least one member. |
|  | componentIdentifier | string | 1..1 | C: RW R: RO U: RW | References a particular service component in the Policy Template. |
|  | application‌Flow‌Description | Application‌Flow‌Description | 1..1 | C: RW R: RO U: RW | The Dynamic Policy invoker's specification of an application flow managed by this Dynamic Policy to be used for application traffic identification purposes in the 5G Core (see clause 7.3.3.2).  When PDU Set handling and/or dynamically changing traffic characteristics are required by the Policy Template identified by policyTemplateId, this property shall also specify the media transport protocol parameters to be used by the Media Access Function for PDU Set and/or dynamically changing traffic characteristics signalling purposes. |
|  | qos‌Specification | Client‌Qos‌Specification | 0..1 | C: RW R: RO U: RW | The Dynamic Policy invoker's network Quality of Service requirements of the application flow described by application‌Flow‌Description.  If omitted, the default provisioned network Quality of Service requirements of the Policy Template indicated in policyTemplateId shall apply to application‌Flow‌Description. |
| bdtSpecification | | Client‌Bdt‌Specification | 0..1 | C: RW R: RO  U: RW | The Background Data Transfer time windows and traffic limits that apply to this Dynamic Policy (see clause 9.3.3.3). |
| qosEnforcement | | boolean | 1..1 | C: RO R: RO U: RO | Indication that the Quality of Service described in qosSpecification is being enforced by the 5G System.  Populated by the Media AF. |

\* \* \* \* Next change \* \* \* \*

## D.1.2 QoS mapping for Dynamic Policy at reference point N5

When the Media AF directly invokes the Npcf\_PolicyAuthorization service at reference point N5 according to TS 29.514 [18], each DynamicPolicy resource is mapped by the Media AF to an Application‌Session‌Context resource in the PCF.

Two alternative implementation options exist for the mapping of the ApplicationFlowBinding object by the Media AF:

1. Each Application‌Flow‌Binding object of the Dynamic Policy Instance (each one representing a distinct Service Component) is associated with a different Media‌Component object in the PCF, as shown in figure D.1.2‑1. A single MediaSubComponent is created to describe the downlink and/or uplink aspects of that Service Component.

NOTE 1: The dynamic traffic characteristics (i.e., data burst size, time to next burst and expedited transfer indication) associate directly to a *Media*‌*Component* object properties *dat*‌*Burst*‌*Size*‌*Ind*, *time*‌*to*‌*Next*‌*Burst*‌*Ind*, and *exp*‌*Tran*‌*Ind*. These reflect the values of corresponding *Qos*‌*Range* properties *downlink*‌*Data*‌*Burst*‌*Size*‌*Marking*, *downlink*‌*Time*‌*To*‌*Next*‌*Burst*‌*Marking*, and respectively, of corresponding *Application*‌*Flow*‌*Binding*’s client QoS specification of *downlink*‌*Expedited*‌*Transfer*‌*Indication*. When any of these are present the *mediaTransportParameters* are further associated with the *protoDescDl* property of the *Media*‌*Component* object.

2. In the limited case where all Service Components share the same minimum desired bit rate, minimum requested bit rate, PDU Set QoS requirements and dynamic traffic characteristics (data burst size and/or time to next burst) marking and none of the QosRange objects cites a qosReference, each Application‌Flow‌Binding object of the Dynamic Policy Instance (each one representing a distinct Service Component) is associated with a different Media‌Sub‌Component object in the PCF, and these all share a common parent Media‌Component object, as shown in figure D.1.2-2.

NOTE 2: The dynamic traffic characteristic of expedited transfer indication is not applicable to this limited case as different QoS requirements are expected between corresponding expedited and non-expedited Application‌Flow‌Binding objects.

In both options, the descriptions of the downlink and/or uplink application flow are populated in the fDescs array of the MediaSubComponent unless a qosReference is cited in the corresponding QosRange.



Figure D.1.2‑1: General case mapping of ApplicationFlowBinding to PCF MediaComponent at reference point N5



Figure D.1.2‑2: Limited case mapping of ApplicationFlowBinding to PCF MediaSubComponent at reference point N5

\* \* \* \* Next change \* \* \* \*

## D.1.3 QoS mapping for Dynamic Policy at reference point N33

When the Media AF invokes the Nnef\_AFsessionWithQoS service at reference point N33 according to TS 29.522 [19] and TS 29.122 [20], each DynamicPolicy resource is mapped by the Media AF to an AsSession‌WithQoS‌Subscription resource in the NEF. The qosReference, protoDescDl, protoDescUl, pduSerQosDl and pduSetQosUl properties are not populated in this resource; the QoS requirements of the Service Component are instead populated in the AsSession‌Media‌Component object.

Each Application‌Flow‌Binding object of the Dynamic Policy Instance (each one representing a distinct Service Component) is associated with a different AsSession‌Media‌Component object in the NEF, as shown in figure D.1.3‑1. The descriptions of the downlink and/or uplink directions of the application flow corresponding to the Service Component are populated the flowInfos array of the AsSession‌Media‌Component unless a qosReference is cited in the corresponding QosRange.

NOTE: Further details about the mapping of dynamic traffic characteristics at reference point N33 according to TS 29.522 [19] and TS 29.122 [20] are for further study.



Figure D.1.3‑1: Mapping of ApplicationFlowBinding to NEF AsSessionMediaComponent at reference point N33

\* \* \* \* End of changes \* \* \* \*