**3GPP TSG CT WG3 134 *C3-242316***

**Changsha, China, 15 - 19 April, 2024 (revision of C3-242xyz)**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **29.514** | **CR** | **0626** | **rev** | **-** | **Current version:** | **18.5.0** |  |
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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 |  | Radio Access Network |  | Core Network | **X** |

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| ***Title:*** | Clean up of Editor's Notes | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson, Huawei | | | | | | | | | |
| ***Source to TSG:*** | C3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item Code:*** | XRM | | | | |  | ***Date:*** | | | 2024-03-24 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***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 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-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19) Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Data Rate monitoring can be reported based on threshold surpass and/or periodically as defined in TS 23.501 5.45.4 and 5.8.2.18. Also, as specified in TS 23.501 5.8.2.18:  - If the *Reporting frequency* indicates "event triggered", a *Reporting threshold* for each parameter in the *QoS monitoring parameter(s)* and a *Minimum waiting time* are provided as well. The UPF shall send a report when the measurement result matches or exceeds the indicated *Reporting threshold*. Subsequent reports should not be sent by the UPF during the *Minimum waiting time*. The UPF shall continue t report a measurement result that matches or exceeds the indicated *Reporting Threshold* when the *Minimum waiting time* is over.  NOTE: As an implementation option, the UPF can be configured to send subsequent report(s) during the *Minimum waiting time*, e.g. if the UPF determines that this report is considerably different from the previous report.  I.e., there are no maximum and minimum values to indicate in a single report.  Congestion measurements are reported based on threshold surpass, and periodic reporting is not specified, as clarified in TS 23.501 clause 5.45.3.  For Packet Delay Variation monitoring, the agreed data types are QosMonitoringInformation and QosMonitoringInformationRm.  For Power Saving feature, it was agreed during CT3#133 that the periodicity is included in the media component attributes periodDl and periodUl, and the protocol description is included within the protoDescDl attribute, as described in 4.2.2.42.  Hence, the related Editor's Notes can be removed. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Removal of the pending Editor's Note.  . | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Editor's Notes remain unsolved. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 4.2.3.23.1, 4.2.5.14, 4.2.6.8, 5.6.2.6, 5.6.2.25, 5.6.2.34, 5.6.2.37, 5.8 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | | This CR does not impact the OpenAPI specification. | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

\* \* \* \* Start of Changes \* \* \* \*

##### 4.2.3.23.1 Modification of Subscriptions to QoS Monitoring at AF session level

This procedure is used by NF service consumer to modify the PCF subscription for notification about real-time measurements of QoS monitoring parameters for a QoS Flow (i.e. when the AF request involves only flows with the same QoS requirements), e.g. packet delay and/or congestion information between UPF and UE, when the "QoSMonitoring" feature is supported.

NOTE 1: When the subscription for QoS Monitoring is for multiple QoS flows, i.e, when the AF-session can contain multiple media components, the subscription for QoS monitoring can only be indicated within the corresponding "medSubComps" entry.

The NF service consumer shall use the HTTP PATCH method to update the "Events Subscription" sub-resource together with the modifications to the "Individual Application Session Context" resource.

The NF service consumer shall include in the HTTP PATCH request message described in clause 4.2.3.2, in the "ascReqData" attribute, the updated values of the "evSubsc" attribute of "EventsSubscReqDataRm" data type, as follows:

- to create a subscription to notifications of QoS monitoring report for packet delay:

a) shall include the "events" array with an array that contains a new entry per requested notification method with the "event" attribute set to "QOS\_MONITORING", and notification related information as described in clause 4.2.2.23;

b) when the "notifMethod" of the new entry is "EVENT\_DETECTION", shall include a "qosMon" attribute with the QoS monitoring information for packet delay as described in clause 4.2.2.23.

NOTE 2: When the "congestMon" attribute is included, only the "EVENT\_DETECTION" reporting frequency is applicable.

c) shall include the new requested QoS monitoring parameter(s) to be measured (i.e. DL,/UL/round trip packet delay) within the "reqQosMonParams" attribute;

d) may include the notification correlation identifier assigned by the AF within the "notifCorreId" attribute;

e) if the feature "ExposureToEAS" is supported, may include the "directNotifInd" attribute set to true to indicate the direct event notification of QoS Monitoring data from the UPF; and

- when the "EnQoSMon" feature is supported, to create an event subscription to QoS monitoring, shall include:

a) the "events" array with a new entry with the "event" attribute set to "QOS\_MONITORING", the requested QoS monitoring parameter type within "qosMonParamType" attribute, and notification related information as described in clause 4.2.2.23.1; and

b) the requested QoS monitoring parameter(s) to be measured within the "reqQosMonParams" attribute as described in clause 4.2.2.23.1; and

c) when the "notifMethod" attribute is set to the value "EVENT\_DETECTION", the corresponding threshold information, as described in clause 4.2.2.23.1; and

may include the notification correlation identifier and direct notification indication, and/or averaging window, as specified in clause 4.2.2.23.1; and

- to remove a subscription to QoS monitoring information for packet delay:

a) shall include the "events" array containing an array that shall omit the corresponding entry with the "event" attribute value "QOS\_MONITORING";

b) when the "notifMethod" attribute of the removed entry is "EVENT\_DETECTION", it shall contain the "qosMon" attribute set to null;

c) if the "directNotifInd" attribute and/or the "avrgWndw" attribute was previously provided, it shall contain the "directNotifInd" attribute and/or the "avrgWndw" attribute set to null.

- when the "EnQoSMon" feature is supported, to remove a subscription to QoS monitoring:

a) shall include the "events" array and shall omit the corresponding entry(ies) with the "event" attribute value "QOS\_MONITORING" and "qosMonParamType" attribute, if applicable;

b) if the notification method of the removed entry is "EVENT\_DETECTION", it shall include the "qosMon" and/or "qosMonDatRate" and/or "congestMon" attribute(s) set to null; and

c) if the "directNotifInd" attribute and/or the "avrgWndw" attribute was previously provided, it shall contain the "directNotifInd" attribute and/or the "avrgWndw" attribute set to null.

If the AF provided an indication of direct event notification, and the PCF determines that the QoS Monitoring reports cannot be notified directly (e.g. the AF requests for monitoring packet delay variation or round trip packet delay when UL and DL are on different service data flows and the information cannot be consolidated in the QoS monitoring policy in the PCC rule), the PCF generates a successful response to the AF and indicates that direct event notification is not possible by including within the "servAuthInfo" attribute the value "DIRECT\_NOTIF\_NOT\_POSSIBLE", as described in clause 4.2.2.23.

As result of this action, the PCF shall set the appropriate subscription to QoS monitoring information for the corresponding active PCC rule(s) as described in 3GPP TS 29.512 [8].

The PCF shall reply to the NF service consumer as described in clause 4.2.3.2.

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

#### 4.2.5.14 Notification about Service Data Flow QoS Monitoring control

When the PCF gets the information about real-time measurements of QoS monitoring parameters for one or more SDFs from the SMF (e.g. for QoS monitoring for packet delay, uplink packet delay(s), downlink packet delay(s) and/or round trip delay(s) or if the feature "PacketDelayFailureReport" is supported, indicator of packet delay measurement failure) the PCF shall inform the NF service consumer accordingly if the NF service consumer has previously subscribed as described in clauses 4.2.2.23 and 4.2.3.23 and 4.2.6.8.

The PCF shall notify the NF service consumer of the QoS monitoring events by including the "EventsNotification" data type in the body of the HTTP POST request as described in clause 4.2.5.2.

The PCF shall include:

- within the "evNotifs" attribute an event entry of the "AfEventNotification" data type with the matched event "QOS\_MONITORING" in the "event" attribute; and

- for QoS monitoring for packet delay, one or more entries of the "qosMonReports" array, where each entry shall containh:

1. the identification of the affected service flows (if not all the flows are affected) encoded in the "flows" attribute if applicable; and:

2. the received packet delay measurement:

a) the uplink packet delays within the "ulDelays" attribute;

b) the downlink packet delays within the "dlDelays" attribute;

c) the round trip packet delays within the "rtDelays" attribute; and/or

d) if the feature "PacketDelayFailureReport" is supported, the packet delay measurement failure indicator within the"pdmf" attribute; and/or

NOTE: The SMF reports one UL, DL and/or round-trip packet delay measurement for each periodic and/or event-triggered report as described in 3GPP TS 29.512 [8]. I.e, the PCF can include only one element within the "ulDelays", "dlDelays", and/or "rtDelays" array(s) respectively, each one with the received report from the SMF for the UL, DL and/or round trip delay(s).

- if the feature "EnQoSMon" is supported, to report data rate measurements, one or more entries of the "qosMonDatRateReps" array, where each entry shall contain:

1. the identification of the affected service flows (if not all the flows are affected) encoded in the "flows" attribute if applicable; and

2. the received data rate measurement:

a) one data rate measurement for the UL within the "ulDataRate" attribute; and/or

b) one data rate measurement for the DL within the "dlDataRate" attribute; and/or.

- if the feature "EnQoSMon" is supported, for QoS monitoring report for congestion information, one or more entries of the "congestReports" array, where each entry sahll contain:

1. the identification of the affected service flows (if not all the flows are affected) encoded in the "flows" attribute if applicable;

2. the received congestion measurement:

a) the uplink congestion information measurement(s) within the "ulConInfo" attribute; and/or

b) the downlink congestion information measurement(s) within the "dlConInfo" attribute.

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

#### 4.2.6.8 Subscription to Service Data Flow QoS Monitoring Information

This procedure is used by NF service consumer to subscribe and/or modify the PCF subscription at AF session level for notification about real-time measurements of QoS monitoring parameters for a QoS flow (i.e. when the AF request involves only flows with the same QoS requirements), e.g. packet delay between UPF and UE, when the "QoSMonitoring" feature is supported.

NOTE 1: When the subscription to QoS Monitoring is for multiple QoS flows, i.e, when the AF-session can contain multiple media components, the subscription for QoS monitoring can only be indicated within the corresponding "medSubComps" entry and the Npcf\_PolicyAuthorization\_Subscribe service operation is not supported.

The NF service consumer shall include in the HTTP PUT request message described in clause 4.2.6.2 the "EventsSubscReqData" data type, that shall contain:

- to create a subscription to notifications of QoS monitoring report(s) the provisions specified in clause 4.2.2.23.1 apply;

NOTE 2: When the "congestMon" attribute is included, only the "EVENT\_DETECTION" reporting frequency is applicable.

- to remove a subscription to QoS monitoring information for packet delay:

a) shall include the "events" array containing an array that shall omit the corresponding entry with the "event" attribute value "QOS\_MONITORING"; and

b) when the "notifMethod" of the removed entry is "EVENT\_DETECTION", it shall omit the "qosMon" and/or "qosMonDatRate" and/or "congestMon" attribute;

c) shall omit the "reqQosMonParams";

d) if the feature "ExposureToEAS" is supported, shall omit the "directNotifInd" attribute;

- when the "EnQoSMon" feature is supported, to remove a subscription to QoS monitoring:

a) shall include the "events" array and shall omit the corresponding entry(ies) with the "event" attribute value "QOS\_MONITORING" and "qosMonParamType" attribute, if applicable;

b) if the notification method of the removed entry is "EVENT\_DETECTION", it shall omit the "qosMon" and/or "qosMonDatRate" and/or "congestMon" attribute(s); and

c) if the "directNotifInd" attribute and/or the "avrgWndw" attribute was previously provided, it shall omit the "directNotifInd" attribute and/or the "avrgWndw" attribute.

The NF service consumer shall include other events related information that shall remain unchanged.

As result of this action, the PCF shall set the appropriate subscription to QoS monitoring information for the corresponding active PCC rule(s) as described in 3GPP TS 29.512 [8].

If the AF provided an indication of direct event notification, and the PCF determines that the QoS Monitoring reports cannot be notified directly (e.g. the AF requests for monitoring packet delay variation or round trip packet delay when UL and DL are on different service data flows and the information cannot be consolidated in the QoS monitoring policy in the PCC rule), the PCF generates a successful response to the AF and indicates that direct event notification is not possible by including within the "servAuthInfo" attribute the value "DIRECT\_NOTIF\_NOT\_POSSIBLE", as described in clause 4.2.2.23.1.

The PCF shall reply to the NF service consumer as described in clause 4.2.6.2.

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

#### 5.6.2.6 Type EventsSubscReqData

Table 5.6.2.6-1: Definition of type EventsSubscReqData

| Attribute name | Data type | P | Cardinality | Description | Applicability |
| --- | --- | --- | --- | --- | --- |
| events | array(AfEventSubscription) | M | 1..N | Subscribed Events. |  |
| notifUri | Uri | O | 0..1 | Notification URI. |  |
| reqQosMonParams | array(RequestedQosMonitoringParameter) | O | 1..N | Indicates the QoS information to be monitored, e.g. UL packet delay, DL packet delay, round trip packet delay and/or UL/DL congestion infomation, and/or UL/DL data rate monitoring, is to be monitored when the QoS Monitoring is enabled for the service data flow. It shall be present when the event "QOS\_MONITORING" is subscribed.  (NOTE 3) | QoSMonitoring |
| qosMon | QosMonitoringInformation | O | 0..1 | Packet delay threshold(s) information. It shall be present when the event "QOS\_MONITORING" is subscribed and event based packet delay measurements are required. | QoSMonitoring |
| qosMonDatRate | QosMonitoringInformation | O | 0..1 | Contains the data rate measurements information (data rate thresholds) for the subscribed report. It shall be present when the event "QOS\_MONITORING" is subscribed and event based data rate measurements are required. | EnQoSMon |
| pdvReqMonParams | array(RequestedQosMonitoringParameter) | O | 1..N | Indicates the Packet Delay Variation to be monitored, e.g. UL packet delay variation, DL packet delay variation and/or round trip packet delay variation between the UE and the UPF is to be monitored. | EnQoSMon |
| pdvMon | QosMonitoringInformation | O | 0..1 | Packet Delay Variation information for the subscribed report. It may be present when the event "PACK\_DEL\_VAR" is subscribed.  (NOTE 1) | EnQoSMon |
| congestMon | QosMonitoringInformation | O | 0..1 | Congestion threshold for the subscribed report. It shall be present when the event "QOS\_MONITORING" is subscribed and event based congestion measurements are required.  (NOTE 3) | EnQoSMon |
| rttMon | QosMonitoringInformation | O | 0..1 | Contains the round-trip delay over two QoS flows information for the subscribed report.  It may be present when the event "RT\_DELAY\_TWO\_QOS\_FLOWS" is subscribed. | EnQoSMon |
| reqAnis | array(RequiredAccessInfo) | C | 1..N | Represents the required access network information. It shall be present when the event "ANI\_REPORT" is subscribed. | NetLoc |
| usgThres | UsageThreshold | O | 0..1 | Includes the volume and/or time thresholds for sponsored data connectivity. | SponsoredConnectivity |
| notifCorreId | string | O | 0..1 | It is used to set the value of Notification Correlation ID in the corresponding notification. | EnhancedSubscriptionToNotification |
| afAppIds | array(AfAppId) | O | 1..N | AF application identifier(s). It shall be present when the event "APP\_DETECTION" is subscribed. | ApplicationDetectionEvents |
| directNotifInd | boolean | O | 0..1 | Indicates that the event notification of QoS Monitoring data is sent by the UPF to Local NEF or AF if it is included and set to true. It may be present when the event "QOS\_MONITORING" is subscribed.  The default value "false" shall apply, if the attribute is not present.  (NOTE 2) | ExposureToEAS  EnQoSMon |
| avrgWndw | AverWindow | O | 0..1 | Averaging window for the calculation of the data rate for the service data flow. It may be included when the "qosMonDatRate" attribute is included. | EnQoSMon |
| NOTE 1: The "pvdMon" attribute, when provided, contains the threshold(s) in units of milliseconds to trigger packet delay variation events for the UL, DL and/or Round Trip within the "repThreshDl", "repThreshUl" and/or "repThreshRp" attribute(s) respectively.  NOTE 2: When the "EnQoSMon" feature is supported, the "directNotifInd" attribute indicates whether direct event notification is requested for the QoS measurement(s) provided in the "reqQosMonParams" attribute.  NOTE 3: Only the "EVENT\_DETECTION" reporting frequency in "notifMethod" attribute included in "events" attribute is applicable when the "reqQosMonParams" includes "DOWNLINK\_CONGESTION" and/or "UPLINK\_CONGESTION". | | | | | |

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

#### 5.6.2.25 Type EventsSubscReqDataRm

This data type is defined in the same way as the "EventsSubscReqData" data type, but:

- with the OpenAPI "nullable: true" property; and

- the removable attribute "usgThres" is defined with the removable data type "UsageThresholdRm"; the removable attribute "avrgWndw" is defined with the removable data type "AverWindowRm"; and removable attributes "qosMon", "qosMonDatRate", "congestMon" and "pdvMon" are defined with the removable data type "QosMonitoringInformationRm".

Table 5.6.2.25-1: Definition of type EventsSubscReqDataRm

| Attribute name | | Data type | | P | | Cardinality | | Description | | Applicability | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| events | | array(AfEventSubscription) | | M | | 1..N | | Subscribed Events. | |  | |
| notifUri | | Uri | | O | | 0..1 | | Notification URI. | |  | |
| reqQosMonParams | | array(RequestedQosMonitoringParameter) | | O | | 1..N | | Indicates the QoS information to be monitored, e.g. UL packet delay, DL packet delay, round trip packet delay, and/or congestion information, and/or data rate is to be monitored when the QoS Monitoring is enabled for the service data flow.  It may be present when the event "QOS\_MONITORING" is subscribed.  (NOTE 3) | | QoSMonitoring | |
| qosMon | | QosMonitoringInformationRm | | O | | 0..1 | | Packet delay threshold(s) information. It may be present when the event "QOS\_MONITORING" is subscribed and event based packet delay measurements are required. | | QoSMonitoring | |
| qosMonDatRate | | QosMonitoringInformationRm | | O | | 0..1 | | Contains the data rate measurements information for the subscribed report. It may be present when the event "QOS\_MONITORING" is subscribed and event-based data rate measurements are required. | | EnQoSMon | |
| pdvReqMonParams | | array(RequestedQosMonitoringParameter) | | O | | 1..N | | Indicates the Packet Delay Variation to be monitored, e.g. UL packet delay, DL packet delay and/or round trip packet delay between the UE and the UPF is to be monitored. | | EnQoSMon | |
| pdvMon | | QosMonitoringInformationRm | | O | | 0..1 | | Packet Delay Variation information for the subscribed report. It may be present when the event "PACK\_DEL\_VAR" is subscribed. | | EnQoSMon | |
| congestMon | | QosMonitoringInformationRm | | O | | 0..1 | | Congestion threshold for the subscribed report. It may be present when the event "QOS\_MONITORING" is subscribed and event-based congestion measurements are required.  (NOTE 3) | | EnQoSMon | |
| reqAnis | | array(RequiredAccessInfo) | | C | | 1..N | | Represents the required access network information. It shall be present when the event "ANI\_REPORT" is subscribed. (NOTE 1) | | NetLoc | |
| usgThres | | UsageThresholdRm | | O | | 0..1 | | Includes the volume and/or time thresholds for sponsored data connectivity. | | SponsoredConnectivity | |
| notifCorreId | | string | | O | | 0..1 | | It is used to set the value of Notification Correlation ID in the corresponding notification. | | EnhancedSubscriptionToNotification | |
| directNotifInd | | boolean | | C | | 0..1 | | Indicates that the event notification of QoS Monitoring data is sent by the UPF to Local NEF or AF if it is included and set to true. It may be present when the event "QOS\_MONITORING" is subscribed.  (NOTE 2) | | ExposureToEAS  EnQoSMon | |
| avrgWndw | | AverWindowRm | | O | | 0..1 | | Averaging window for the calculation of the data rate for the service data flow | | EnQoSMon | |
| NOTE 1: "ANI\_REPORT" is the one-time reported event and thus the attribute "reqAnis" is not defined as removable attribute (i.e. with the removable data type "RequiredAccessInfoRm"). Once the access network information is reported to the NF service consumer the subscription to this event is automatically terminated in the PCF and the related information is removed.  NOTE 2: When the "EnQoSMon" feature is supported, the "directNotifInd" attribute indicates whether direct event notification is requested for the QoS measurement(s) provided (or previously provided) in the "reqQosMonParams" attribute.  NOTE 3: Only the "EVENT\_DETECTION" reporting frequency in "notifMethod" attribute included in "events" attribute is applicable when the "reqQosMonParams" includes "DOWNLINK\_CONGESTION" and/or "UPLINK\_CONGESTION". | | | | | | | | | | | |

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

#### 5.6.2.34 Type QosMonitoringInformation

Table 5.6.2.34-1: Definition of type QosMonitoringInformation

| Attribute name | Data type | P | Cardinality | Description | Applicability |
| --- | --- | --- | --- | --- | --- |
| repThreshDl | integer | O | 0..1 | Indicates the threshold in units of milliseconds for DL packet delay.  If the "EnQoSMon" feature is supported, and the "PACK\_DEL\_VAR" event is subscribed, it indicates the threshold for DL PDV measurement.  Only applicable when the "notifMethod" attribute is not supplied or the "notifMethod" is supplied and set to "EVENT\_DETECTION".  Minimum = 0. |  |
| repThreshUl | integer | O | 0..1 | Indicates the threshold in units of milliseconds for UL packet delay.  If the "EnQoSMon" feature is supported, and the "PACK\_DEL\_VAR" event is subscribed, it indicates the threshold for UL PDV measurement.  Only applicable when the "notifMethod" attribute is not supplied or the "notifMethod" is supplied and set to "EVENT\_DETECTION".  Minimum = 0. |  |
| repThreshRp | integer | O | 0..1 | Indicates the threshold in units of milliseconds for round trip packet delay.  If the "EnQoSMon" feature is supported and the "RT\_DELAY\_TWO\_QOS\_FLOWS" event is subscribed, it indicates the threshold for round trip delay of two QoS flows.  If the "EnQoSMon" feature is supported, and the "PACK\_DEL\_VAR" event is subscribed, it indicates the threshold for round trip PDV measurement.  Only applicable when the "notifMethod" attribute is not supplied or the "notifMethod" is supplied and set to "EVENT\_DETECTION".  Minimum = 0. |  |
| repThreshDatRateDl | BitRate | O | 0..1 | Indicates the threshold for DL data rate. Only applicable when the "notifMethod" attribute is not supplied or the "notifMethod" is supplied and set to "EVENT\_DETECTION". | EnQoSMon |
| repThreshDatRateUl | BitRate | O | 0..1 | Indicates the threshold for UL data rate. Only applicable when the "notifMethod" attribute is not supplied or the "notifMethod" is supplied and set to "EVENT\_DETECTION". | EnQoSMon |
| conThreshDl | Uinteger | O | 0..1 | Indicates the downlink threshold percentage of congestion reporting. Only applicable when the "notifMethod" attribute is not supplied or the "notifMethod" is supplied and set to "EVENT\_DETECTION". | EnQoSMon |
| conThreshUl | Uinteger | O | 0..1 | Indicates the uplink threshold percentage of congestion reporting. Only applicable when the "notifMethod" attribute is not supplied or the "notifMethod" is supplied and set to "EVENT\_DETECTION". | EnQoSMon |
| NOTE: When the "EnQoSMon" is not supported, the "repThreshDl" attribute and/or the "repThreshUl" attribute and/or the "repThreshRp" attribute shall be present, when the "EnQoSMon" feature is supported, either the "repThreshDataRateDl" attribute and/or the "repThreshDataRateUl" attribute shall present, or the "repThreshDl" attribute and/or the "repThreshUl" attribute and/or the "repThreshRp" attribute shall be present. | | | | | |

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

#### 5.6.2.37 Type QosMonitoringReport

Table 5.6.2.37-1: Definition of type QosMonitoringReport

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| flows | array(Flows) | C | 1..N | Identification of the flows. It shall be included if "MediaComponentVersioning" feature is supported. When "MediaComponentVersioning" feature is not supported, if no flows are provided, the packet delay applies for all flows within the AF session. |  |
| ulDelays | array(integer) | O | 1..N | Uplink packet delay in units of milliseconds. (NOTE 1) |  |
| dlDelays | array(integer) | O | 1..N | Downlink packet delay in units of milliseconds. (NOTE 1) |  |
| rtDelays | array(integer) | O | 1..N | Round trip delay in units of milliseconds. (NOTE 1)  If the "EnQoSMon" feature is supported and the "RT\_DELAY\_TWO\_QOS\_FLOWS" event is subscribed, it indicates the round trip delay of multiple QoS flows. |  |
| pdmf | boolean | O | 0..1 | Packet delay measurement failure indicator. When set to true, it indicates that a packet delay failure has occurred.  Default value is false if omitted. (NOTE 2) | PacketDelayFailureReport  EnQoSMon |
| ulDataRate | BitRate | O | 0..1 | Uplink data rate.  (NOTE 3) | EnQoSMon |
| dlDataRate | BitRate | O | 0..1 | Downlink data rate.  (NOTE 3) | EnQoSMon |
| ulConInfo | Uinteger | O | 0..1 | Percentage of uplink congestion level for exposure (without "%" sign). It may be present when the event "QOS\_MONITORING" is subscribed. | EnQoSMon |
| dlConInfo | Uinteger | O | 0..1 | Percentage of downlink congestion level for exposure (without "%" sign). It may be present when the event "QOS\_MONITORING" is subscribed. | EnQoSMon |
| NOTE 1: In this release of the specification one element may be included in the array, as specified in clause 4.2.5.14.  NOTE 2: When the "pdmf" attribute is set to true, "ulDelays", "dlDelays" and "rtDelays" shall not be present.  NOTE 3: When the "ulDataRate" and/or the "dlDataRate" attribute are included, the "pdmf", "ulDelays", "dlDelays" and "rtDelays" shall not be present. | | | | | |

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

## 5.8 Feature negotiation

The optional features in table 5.8-1 are defined for the Npcf\_PolicyAuthorization API. They shall be negotiated using the extensibility mechanism defined in clause 6.6.2 of 3GPP TS 29.500 [5].

When requesting the PCF to create an Individual Application Session Context resource the NF service consumer shall indicate the optional features the NF service consumer supports for the Npcf\_PolicyAuthorization service by including the "suppFeat" attribute in the "AppSessionContextReqData" data type of the HTTP POST request.

The PCF shall determine the supported features for the created Individual Application Session Context resource as specified in clause 6.6.2 of 3GPP TS 29.500 [5]. The PCF shall indicate the supported features in the HTTP response confirming the creation of the Individual Application Session Context resource by including the "suppFeat" attribute in the "AppSessionContextRespData" data type.

Table 5.8-1: Supported Features

| Feature number | Feature Name | Description |
| --- | --- | --- |
| 1 | InfluenceOnTrafficRouting | Indicates support of Application Function influence on traffic routing. If the PCF supports this feature, the NF service consumer may influence SMF routing to applications or subscribe to notifications of UP path management for the traffic flows of an active PDU session. |
| 2 | SponsoredConnectivity | Indicates support of sponsored data connectivity. If the PCF supports this feature, the NF service consumer may provide sponsored data connectivity to the SUPI. |
| 3 | MediaComponentVersioning | Indicates the support of the media component versioning. |
| 4 | URLLC | Indicates support of Ultra-Reliable Low-Latency Communication (URLLC) requirements, i.e. AF application relocation acknowledgement and UE address(es) preservation. The InfluenceOnTrafficRouting feature shall be supported in order to support this feature. |
| 5 | IMS\_SBI | Indicates support of the communication with the 5GC IMS NF service consumer via Service Based Interfaces. |
| 6 | NetLoc | Indicates the support of access network information reporting. |
| 7 | ProvAFsignalFlow | This indicates support for the feature of provisioning of AF signalling flow information as described in clauses 4.2.2.16 and 4.2.3.17. If the PCF supports this feature the NF service consumer may provision AF signalling flow information.  NOTE: This feature is used by the IMS Restoration Procedures to provide to the SMF the address of the P-CSCF selected by the UE, refer to 3GPP TS 23.380 [39].  The IMS\_SBI feature shall be supported in order to support this feature. |
| 8 | ResourceSharing | This feature indicates the support of resource sharing across several "Individual Application Session Context" resources. The IMS\_SBI feature shall be supported in order to support this feature. |
| 9 | MCPTT | This feature indicates the support of Mission Critical Push To Talk services as described in 3GPP TS 24.379 [41]. |
| 10 | MCVideo | This feature indicates the support of Mission Critical Video services as described in 3GPP TS 24.281 [43]. |
| 11 | PrioritySharing | This feature indicates that Priority Sharing is supported as described in 3GPP TS 23.503 [4], clause 6.1.3.15. |
| 12 | MCPTT-Preemption | This feature indicates the support of service pre-emption based on the information provided by the NF service consumer. It requires that both PrioritySharing and MCPTT features are also supported. |
| 13 | MacAddressRange | Indicates the support of a set of MAC addresses with a specific range in the traffic filter. |
| 14 | RAN-NAS-Cause | This feature indicates the support for the release cause code information from the access network. |
| 15 | EnhancedSubscriptionToNotification | Indicates the support of:  - Subscription to periodic notifications.  - Definition of a waiting time between the reporting of two event triggered events.  - Indication of whether the event has to be reported at PDU Session termination.  - Notification Correlation Id for a subscription to an event. |
| 16 | QoSMonitoring | Indicates the support of QoS monitoring functionality and the report of packet delay monitoring. This feature requires the support of the EnhancedSubscriptionToNotification feature. |
| 17 | AuthorizationWithRequiredQoS | Indicates support of policy authorization for the AF session with required QoS. |
| 18 | TimeSensitiveNetworking | Indicates that the 5G System is integrated within the external network as a TSN bridge. |
| 19 | PCSCF-Restoration-Enhancement | This feature indicates support of P-CSCF Restoration Enhancement. It is used for the PCF and the P-CSCF to indicate if they support P-CSCF Restoration Enhancement. |
| 20 | CHEM | This feature indicates the support of Coverage and Handover Enhancements for Media (CHEM). |
| 21 | FLUS | This feature indicates the support of FLUS functionality as described in 3GPP TS 26.238 [51]. |
| 22 | EPSFallbackReport | This feature indicates the support of the report of EPS Fallback as defined in clauses 4.2.2.30, 4.2.3.29 and 4.2.5.15. |
| 23 | ATSSS | Indicates the support of the report of the multiple access types of a MA PDU session. |
| 24 | QoSHint | This feature indicates the support of specific QoS hint parameters as described in 3GPP TS 26.114 [30], clause 6.2.10. |
| 25 | ReallocationOfCredit | This feature indicates the support of notifications of reallocation of credits events. It requires the support of IMS\_SBI feature. |
| 26 | ES3XX | Extended Support for 3xx redirections. This feature indicates the support of redirection for any service operation, according to Stateless NF procedures as specified in clauses 6.5.3.2 and 6.5.3.3 of 3GPP TS 29.500 [5] and according to HTTP redirection principles for indirect communication, as specified in clause 6.10.9 of 3GPP TS 29.500 [5]. |
| 27 | DisableUENotification | Indicates the support of disabling QoS flow parameters signalling to the UE when the SMF is notified by the NG-RAN of changes in the fulfilled QoS situation. This feature requires that the AuthorizationWithRequiredQoS featute is also supported. |
| 28 | PatchCorrection | Indicates support of the correction to the PATCH method:  When this feature is not supported, the interoperability between a NF service consumer and the PCF can only be ensured when it is not required the update of the Individual Application Session Context resource. |
| 29 | MPSforDTS | Indicates support for MPS for DTS as described in clauses 4.2.2.12.2 and 4.2.3.12. |
| 30 | ApplicationDetectionEvents | This feature indicates the support of the subscription to notifications of the detection of the start and stop of an application's traffic. |
| 31 | TimeSensitiveCommunication | Indicates that the 5G System is integrated within the external network as a TSC user plane node to enable Time Sensitive Communication, Time Synchronization and Deterministic Networking. This feature requires that the TimeSensitiveNetworking feature is also supported. |
| 32 | ExposureToEAS | This feature indicates the support of the indication of direct event notification of QoS monitoring events from the UPF to the Local NEF or AF in 5GC. This indication requires that the QoSMonitoring feature is supported. |
| 33 | SatelliteBackhaul | Indicates the support of the report of the satellite or non-satellite backhaul category of the PDU session. |
| 34 | RoutingReqOutcome | Indicates the support of:  - the report of UP path change failures; and  - the indication of whether AF routing requirements are applied.  It requires the support of InfluenceOnTrafficRouting feature. |
| 35 | EASDiscovery | This feature indicates the support of EAS (re)discovery. |
| 36 | AltSerReqsWithIndQoS | Indicates the support of provisioning Alternative Service Requirements with individual QoS parameters. This feature requires that the AuthorizationWithRequiredQoS feature is also supported. |
| 37 | SimultConnectivity | This feature indicates the support of the indication of temporary simultaneous connectivity over source and target PSA at edge relocation. This indication requires that the InfluenceOnTrafficRouting feature is supported. |
| 38 | EASIPreplacement | This feature indicates the support of provisioning of EAS IP replacement info. This support requires that InfluenceOnTrafficRouting feature is also supported |
| 39 | AccNetChargId\_String | This feature indicates the support of long character strings as access network charging identifier. |
| 40 | WLAN\_Location | This feature indicates the support of the report of the WLAN location information received from the ePDG/EPC, if available. It is only applicable to EPS interworking scenarios as described in 3GPP TS 29.512 [8], Annex B. |
| 41 | AF\_latency | This feature indicates support for edge relocation considering user plane latency. |
| 42 | UEUnreachable | This feature indicates the support for the reporting of UE temporary unavailable. |
| 43 | AltQoSProfilesSupportReport | This feature indicates the support of the report of whether Alternative QoS parameters are supported by NG-RAN. This feature requires that AuthorizationWithRequiredQoS feature is also supported. |
| 44 | PacketDelayFailureReport | Indicates the support of packet delay failure report as part of QoS Monitoring procedures. This feature requires that QoSMonitoring feature is supported. |
| 45 | EnTSCAC | Indicates the support of extensions to TSCAC and the RAN feedback for BAT offset and adjusted periodicity.  This feature requires that the TimeSensitiveCommunication feature is also supported. |
| 46 | SignalingPathValidation | This feature indicates the support of the validation of the NF type that originates the Npcf\_PolicyAuthorization\_Create request. |
| 47 | ExtQoS | This feature indicates the support for the extensions to the QoS mechanisms. |
| 48 | CommonEASDNAI | This feature controls the support of the common EAS/DNAI selection. This feature requires that the InfluenceOnTrafficRouting feature is alos supported. |
| 49 | SFC | This feature indicates support of Service Function Chaining functionality. |
| 50 | MultiMedia | This feature indicates the support of multi-modal or multimedia communication service. This feature acts as a basic functional block for extended reality (XR) and interactive media services. |
| 51 | EnSatBackhaulCatChg | This feature indicates the support also of the report of the dynamic  satellite backhaul category of the PDU session. This feature requires the support of SatelliteBackhaul feature. |
| 52 | MTU\_Size | This feature indicates the support of the report of the MTU size of the device side port. This feature requires that the TimeSensitiveCommunication feature is also supported. |
| 53 | ExtraUEaddrReport | This feature indicates the support of the report of additional IP addresses or address ranges allocated for the given PDU session resulting from framed routes or IPv6 prefix delegation. |
| 54 | AuthorizationForMpsSignalling | This feature indicates support for use of the "mpsAction" attribute to signal that the UE's MPS subscription shall be checked by the PCF prior to enabling MPS for AF signalling. |
| 55 | ExposureToTSC | This feature indicates the support of the direct event notification of TSC management information from the UPF to the TSCTSF or TSN AF in 5GC. This feature requires that the TimeSensitiveCommunication feature is also supported. |
| 56 | URSPEnforcement | This feature indicates the support of awareness of URSP rule enforcement |
| 57 | AddFlowDescriptionInformation | This feature indicates support for use e.g. of additional flow description parameters, as the flow label and the IPSec SPI. |
| 58 | QoSTiming\_5G | This feature indicates the support of QoS timing information for the transfer and support of data transmission (e.g., AI/ML traffic transmission). |
| 59 | PDUSetHandling | This feature indicates the support of PDU Set handling. This feature may be used for eXtended Reality (XR) and interactive media services. |
| 60 | RTLatency | This feature indicates the support of Round-Trip latency. This feature may be used for eXtended Reality (XR) and interactive media services. |
| 61 | EnQoSMon | This feature indicates the support of enhanced QoS monitoring functionality, i.e. the report of the congestion information, and/or, the RTT delay over two QoS flows, and/or, the data rate information, and/or, the Packet Delay Variation monitoring.  This feature requires that the QoSMonitoring feature is supported. |
| 62 | PowerSaving | This feature indicates the support of UE Power Saving management in multi modal traffic as described in clause 4.2.2.42. |
| 63 | L4S | This feature indicates the support of the AF indication of ECN marking for L4S support. |

\* \* \* \* End of change \* \* \* \*