**3GPP TSG CT WG3 134 *C3-242319***

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

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **29.514** | **CR** | **0628** | **rev** | **-** | **Current version:** | **18.5.0** |  |
|  | | | | | | | | |
| *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:*** | Corrections to threshold conditions and reporting conditions | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson, Huawei | | | | | | | | | |
| ***Source to TSG:*** | C3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item Code:*** | XRM | | | | |  | ***Date:*** | | | 2024-04-19 |
|  |  | | | |  | |  | | |  |
| ***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:*** | | NOTE in clause 5.6.2.34 and 5.6.2.41 is incomplete, missing information about the congestion related attributes in relation with packet delay and data rate monitoring.  NOTE 2 in clause 5.6.2.37 is missing that no information about other QoS parameters measurements can be present. NOTE 3 in clause 5.6.2.37 is missing the conditions related to Congestion control. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | NOTE in clause 5.6.2.34 and 5.6.2.41 is removed, and the presence conditions are included in the attributes that use this data type within the EventsSubscReqData and EventsSubscReqDataRm.  NOTE 2 in clause 5.6.2.37 is removed.  NOTE 3 in clause 5.6.2.37 is removed. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Ambiguous and incomplete information about the presence condition of QosMonitoringInformation/Rm and QosMonitoringReport data types. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.6.2.6, 5.6.2.25, 5.6.2.34, 5.6.2.37, 5.6.2.41 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 \* \* \* \*

#### 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 2) | 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.  Only the "repThreshDl", "repThreshUl" and/or "repThreshRp" attributes may be present within the "QosMonitoringInformation" data type. | 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.  Only the "repThreshDatRateDl", and/or the "repThreshDatRateUl" attributes may be present within the "QosMonitoringInformation" data type. | 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.  Only the "DOWNLINK", "UPLINK" or "ROUNDTRIP" value may be present within the "RequestedQosMonitoringParameter" data type. | 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.  Only the "repThreshDl", "repThreshUl" and/or "repThreshRp" attributes may be present within the "QosMonitoringInformation" data type. | 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.  Only the "conThreshDl" and/or the "conThreshUl" attributes may be present within the "QosMonitoringInformation" data type. (NOTE 2) | 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.  Only the "repThreshRp" attribute may be present within the "QosMonitoringInformation" data type. | 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 1) | 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: 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 2: 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. | | 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.  Only the "repThreshDl", "repThreshUl" and/or "repThreshRp" attributes may be present within the "QosMonitoringInformationRm" data type. | | 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.  Only the "repThreshDatRateDl", and/or the "repThreshDatRateUl" attributes may be present within the "QosMonitoringInformationRm" data type. | | 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.  Only the "DOWNLINK", "UPLINK" or "ROUNDTRIP" value may be present within the "RequestedQosMonitoringParameter" data type. | | 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.  Only the "repThreshDl", "repThreshUl" and/or "repThreshRp" attributes may be present within the "QosMonitoringInformationRm" data type. | | 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.  Only the "conThreshDl" and/or the "conThreshUl" attributes may be present within the "QosMonitoringInformationRm" data type.(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". | | | | | | | | | | | |

Editor’s Note: It is FFS whether the QoS monitoring requirements for congestion measurements are different than the ones for packet delay, i.e., it is FFS whether reporting period and reporting frequency apply, or different criteria needs to be applied.

\* \* \* \* 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 |

Editor’s note: Whether the applicable reporting frequency for the Data Rate QoS monitoring can be event triggered and/or periodic is FFS.

\* \* \* \* 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) |  |
| dlDelays | array(integer) | O | 1..N | Downlink packet delay in units of milliseconds. (NOTE) |  |
| rtDelays | array(integer) | O | 1..N | Round trip delay in units of milliseconds. (NOTE)  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. | PacketDelayFailureReport  EnQoSMon |
| ulDataRate | BitRate | O | 0..1 | Uplink data rate. | EnQoSMon |
| dlDataRate | BitRate | O | 0..1 | Downlink data rate. | 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: In this release of the specification one element may be included in the array, as specified in clause 4.2.5.14. | | | | | |

Editor’s note: Whether a maximum and minimum data rate measurements calculated during the waiting time interval are the applicable is FFS.

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

#### 5.6.2.41 Type QosMonitoringInformationRm

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

* with the OpenAPI "nullable: true" property; and
* the removable attributes "repThreshDatRateDl" and "repThreshDatRateUl" are defined with the removable data types "BitRateRm" and "UintegerRm".

Table 5.6.2.41-1: Definition of type QosMonitoringInformationRm

| Attribute name | Data type | P | Cardinality | Description | Applicability |
| --- | --- | --- | --- | --- | --- |
| repThreshDl | integer | O | 0..1 | Indicates the threshold in units of milliseconds for DL packet delay. 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. 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 round trip delay of multiple QoS flows.  Only applicable when the "notifMethod" attribute is not supplied or the "notifMethod" is supplied and set to "EVENT\_DETECTION".  Minimum = 0. |  |
| repThreshDatRateDl | BitRateRm | 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 | BitRateRm | 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 | UintegerRm | 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 | UintegerRm | 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 |

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