**3GPP TSG-RAN WG3 Meeting #127bis R3-252371**

**Wuhan, China, 7th – 11th April 2025**

**Agenda item: 21.3**

**Source: Nokia, Nokia Shanghai Bell, CMCC, Huawei, CATT**

**Title: (TP to BL CR for TS 38.413) enhancement for available data rate report**

**Document for: Discussion and Decision**

# 1 Introduction

This TP proposes NGAP enhancements to support available data rate report.

* Add *Monitoring Request on Available Data Rate* IE in the *GBR QoS Flow Information* IE.

# TP to TS 38.413 BL CR to support available data rate report

***-----------------Start of the Changes-------------------***

### 8.2.1 PDU Session Resource Setup

#### 8.2.1.1 General

The purpose of the PDU Session Resource Setup procedure is to assign resources on Uu and NG-U for one or several PDU sessions and the corresponding QoS flows, and to setup corresponding DRBs for a given UE. The procedure uses UE-associated signalling.

#### 8.2.1.2 Successful Operation

<<<<<<<<<<<<<<<<<<<< Unaffected part is skipped >>>>>>>>>>>>>>>>>>>>

For each PDU session in the PDU SESSION RESOURCE SETUP REQUEST message, if the *Alternative QoS Parameters Set List* IE is included in the *GBR QoS Flow Information* IE in the *PDU Session Resource Setup Request Transfer* IE of the PDU SESSION RESOURCE SETUP REQUEST message, the NG-RAN node may accept the setup of the QoS flow when notification control has been enabled if the requested QoS parameters or at least one of the alternative QoS parameters sets can be fulfilled at the time of setup. In case the NG-RAN node accepts the setup fulfilling one of the alternative QoS parameters it shall indicate the alternative QoS parameters set which it currently fulfils in the *Current QoS Parameters Set Index* IE within the *PDU Session Resource Setup Response Transfer* IE of the PDU SESSION RESOURCE SETUP RESPONSE message. If the NG-RAN node receives a PDU SESSION RESOURCE SETUP REQUEST message containing the *Delay Critical* IE in the *Dynamic 5QI Descriptor* IE of the *QoS Flow Level QoS Parameters* IE of the *PDU Session Resource Setup Request Transfer* IE set to the value "delay critical" but the *Maximum Data Burst Volume* IE is not present in the *Alternative QoS Parameters Set List* IE, the NG-RAN node shall use the *Maximum Data Burst Volume* IE included in the *Dynamic 5QI Descriptor* IE.

For each QoS flow which has been successfully established, the NG-RAN node shall, if supported, store the *Redundant QoS* *Flow Indicator* IE if included in the *PDU Session Resource Setup Request Transfer* IE contained in the PDU SESSION RESOURCE SETUP REQUEST message and consider it for the redundant transmission as specified in TS 23.501 [9].

For each QoS flow which has been successfully established, if the *QoS Monitoring Request* IE was included in the *QoS Flow Level QoS Parameters* IE contained in the PDU SESSION RESOURCE SETUP REQUEST message, the NG-RAN node shall store this information, and, if supported, perform delay measurement and QoS monitoring, as specified in TS 23.501 [9]. If the *QoS Monitoring Reporting Frequency* IE was included in the *QoS Flow Level QoS Parameters* IE contained in the PDU SESSION RESOURCE SETUP REQUEST message, the NG-RAN node shall store this information and, if supported, use it for RAN part delay reporting.

For each GBR QoS flow which has been successfully established, if the *Monitoring Request on Available Data Rate* IE was included in the *GBR QoS Flow Information* IE in the *PDU Session Resource Setup Request Transfer* IE of the PDU SESSION RESOURCE SETUP REQUEST message, the NG-RAN node shall, if supported, store this information and perform Available bitrate monitoring, as specified in TS 23.501 [9].

For each QoS flow requested to be setup, if the *PDU Set QoS Parameters* IE is included in the *QoS Flow Level QoS Parameters* IE contained in the PDU SESSION RESOURCE SETUP REQUEST message, the NG-RAN node shall, if supported, store the received PDU Set QoS Parameters in the UE context and use it as specified in TS 23.501 [9]. If the *ECN Marking or Congestion Information Reporting Request* IE is included in the *PDU Session Resource Setup Request Transfer* IE contained in the PDU SESSION RESOURCE SETUP REQUEST message, the NG-RAN node shall, if supported, use it accordingly for the specific QoS flow. If the *ECN Marking or Congestion Information Reporting Status* IE is included in the *PDU Session Resource Setup Response Transfer* IE, the SMF shall, if supported, use it to deduce if ECN marking at NG-RAN or ECN marking at UPF or congestion information reporting is active or not active.

***-----------------Next Changes-------------------***

### 8.2.3 PDU Session Resource Modify

#### 8.2.3.1 General

The purpose of the PDU Session Resource Modify procedure is to enable configuration modifications of already established PDU session(s) for a given UE. It is also to enable the setup, modification and release of the QoS flow for already established PDU session(s). The procedure uses UE-associated signalling.

#### 8.2.3.2 Successful Operation

<<<<<<<<<<<<<<<<<<<< Unaffected part is skipped >>>>>>>>>>>>>>>>>>>>

- decide to establish a new NG-U tunnel to replace the failed one, in which case it shall include, as applicable, either the new *DL NG-U UP TNL Information* IE or the *Additional DL NG-U UP TNL Information* IE, and set the *User Plane Failure Indication Report* IE in the *PDU Session Resource Modify Response Transfer* IE to "new transport address allocated" and use the *UL NG-U UP TNL Information* IE in the *User Plane Failure Indication* IE for the uplink data.

For each QoS flow which has been successfully added or modified, if the *QoS Monitoring Request* IE was included in the *QoS Flow Level QoS Parameters* IE contained in the PDU SESSION RESOURCE MODIFY REQUEST message, the NG-RAN node shall store this information, and, if supported, perform delay measurement and QoS monitoring, as specified in TS 23.501 [9]. If the *QoS Monitoring Reporting Frequency* IE was included in the *QoS Flow Level QoS Parameters* IE contained in the PDU SESSION RESOURCE MODIFY REQUEST message, the NG-RAN node shall store this information and, if supported, use it for RAN part delay reporting.

For each GBR QoS flow which has been successfully added or modified, if the *Monitoring Request on Available Data Rate* IE was included in the *GBR QoS Flow Information* IE in the *PDU Session Resource Modify Request Transfer* IE of the PDU SESSION RESOURCE MODIFY REQUEST message, the NG-RAN node shall, if supported, store this information and perform Available bitrate monitoring, as specified in TS 23.501 [9].

The NG-RAN node shall report to the AMF, in the PDU SESSION RESOURCE MODIFY RESPONSE message, the result for each PDU session requested to be modified listed in the PDU SESSION RESOURCE MODIFY REQUEST message:

***-----------------Next Changes-------------------***

#### 9.3.1.10 GBR QoS Flow Information

This IE indicates QoS parameters for a GBR QoS flow for downlink and uplink.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| Maximum Flow Bit Rate Downlink | M |  | Bit Rate9.3.1.4 | Maximum Bit Rate in DL. Details in TS 23.501 [9]. | - |  |
| Maximum Flow Bit Rate Uplink | M |  | Bit Rate9.3.1.4 | Maximum Bit Rate in UL. Details in TS 23.501 [9]. | - |  |
| Guaranteed Flow Bit Rate Downlink | M |  | Bit Rate9.3.1.4 | Guaranteed Bit Rate (provided there is data to deliver) in DL. Details in TS 23.501 [9]. | - |  |
| Guaranteed Flow Bit Rate Uplink | M |  | Bit Rate9.3.1.4 | Guaranteed Bit Rate (provided there is data to deliver) in UL. Details in TS 23.501 [9]. | - |  |
| Notification Control | O |  | ENUMERATED (notification requested, ...)  | Details in TS 23.501 [9]. | - |  |
| Maximum Packet Loss Rate Downlink | O |  | Packet Loss Rate9.3.1.79 | Indicates the maximum rate for lost packets that can be tolerated in the downlink direction. Details in TS 23.501 [9]. | - |  |
| Maximum Packet Loss Rate Uplink | O |  | Packet Loss Rate9.3.1.79 | Indicates the maximum rate for lost packets that can be tolerated in the uplink direction. Details in TS 23.501 [9]. | - |  |
| Alternative QoS Parameters Set List | O |  | 9.3.1.151 | Indicates alternative sets of QoS parameters for the QoS flow. | YES | ignore |
| Monitoring Request on Available Data Rate |  | *0..1* |  |  | YES | ignore |
| >Monitoring Request | M |  | ENUMERATED (ul, dl, both, stop, …) | Indicates to monitor and report UL, or DL, or both UL/DL available data rate for the associated QoS flow as specified in TS 23.501 [9], or stop the corresponding QoS monitoring. | - | ignore |
| >DL Available Data Rate Report Thresholds | C-ifReportDL |  | Available Data Rate Report Threshold List9.3.1.x |  | - | ignore |
| >UL Available Data Rate Report Thresholds | C-ifReportUL |  | Available Data Rate Report Threshold List9.3.1.x |  | - | ignore |

|  |  |
| --- | --- |
| Condition | Explanation |
| ifReportDL | This IE shall be present if the *Monitoring Request* IE is set to the value “dl” or “both”. |
| ifReportUL | This IE shall be present if the Monitoring Request IE is set to the value “ul” or “both”. |

***-----------------Next Changes-------------------***

#### 9.3.1.x Available Data Rate Report Threshold List

This IE contains a list of available data rate report thresholds. It is used for available data rate report for UL and DL as specified in TS 23.501 [9].

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description |
| **Available Data Rate Report Threshold Item** |  | *1..<maxnoofThresholds>* |  |  |
| >Reporting Threshold | M |  | INTEGER (0..FFS) | FFS |

|  |  |
| --- | --- |
| Range bound | Explanation |
| maxnoofThresholds | Maximum no. of thresholds allowed to be provided by the SMF. Value is FFS. |

***-----------------Next Changes-------------------***

### 9.4.5 Information Element Definitions

-- ASN1START

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

--

-- Information Element Definitions

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-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

NGAP-IEs {

itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)

ngran-Access (22) modules (3) ngap (1) version1 (1) ngap-IEs (2) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS

 id-AdditionalDLForwardingUPTNLInformation,

<<<<<<<<<<<<<<<<<<<< Unaffected part is skipped >>>>>>>>>>>>>>>>>>>>

 id-QoERVQoEReportingPaths,

 id-UserLocationInformationN3IWF-without-PortNumber,

 id-MonitoringRequestonAvailableDataRate,

 maxnoofAllowedAreas,

 maxnoofAllowedCAGsperPLMN,

<<<<<<<<<<<<<<<<<<<< Unaffected part is skipped >>>>>>>>>>>>>>>>>>>>

 maxnoofRSPPQoSFlows,

 maxnoofThresholds

FROM NGAP-Constants

<<<<<<<<<<<<<<<<<<<< Unaffected part is skipped >>>>>>>>>>>>>>>>>>>>

AreaScopeOfQMC ::= CHOICE {

 cellBased CellBasedQMC,

 tABased TABasedQMC,

 tAIBased TAIBasedQMC,

 pLMNAreaBased PLMNAreaBasedQMC,

 choice-Extensions ProtocolIE-SingleContainer { { AreaScopeOfQMC-ExtIEs} }

}

AreaScopeOfQMC-ExtIEs NGAP-PROTOCOL-IES ::= {

 ...

}

AvailableDataRateReportThresholdList ::= SEQUENCE (SIZE(1..maxnoofThresholds)) OF AvailableDataRateReportThresholdItem

AvailableDataRateReportThresholdItem ::= SEQUENCE {

 reportingThreshold ReportingThreshold,

 iE-Extensions ProtocolExtensionContainer { { AvailableDataRateReportThresholdItem-ExtIEs} } OPTIONAL,

 ...

}

AvailableDataRateReportThresholdItem-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

 ...

}

AvailableRANVisibleQoEMetrics ::= SEQUENCE {

 applicationLayerBufferLevelList ENUMERATED {true, ...} OPTIONAL,

 playoutDelayForMediaStartup ENUMERATED {true, ...} OPTIONAL,

 iE-Extensions ProtocolExtensionContainer { { AvailableRANVisibleQoEMetrics-ExtIEs} } OPTIONAL,

 ...

}

AvailableRANVisibleQoEMetrics-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

 ...

}

-- G

GBR-QosInformation ::= SEQUENCE {

 maximumFlowBitRateDL BitRate,

 maximumFlowBitRateUL BitRate,

 guaranteedFlowBitRateDL BitRate,

 guaranteedFlowBitRateUL BitRate,

 notificationControl NotificationControl OPTIONAL,

 maximumPacketLossRateDL PacketLossRate OPTIONAL,

 maximumPacketLossRateUL PacketLossRate OPTIONAL,

 iE-Extensions ProtocolExtensionContainer { {GBR-QosInformation-ExtIEs} } OPTIONAL,

 ...

}

GBR-QosInformation-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

 { ID id-AlternativeQoSParaSetList CRITICALITY ignore EXTENSION AlternativeQoSParaSetList PRESENCE optional }|

 { ID id-MonitoringRequestonAvailableDataRate CRITICALITY ignore EXTENSION MonitoringRequestonAvailableDataRate PRESENCE optional },

 ...

}

<<<<<<<<<<<<<<<<<<<< Unaffected part is skipped >>>>>>>>>>>>>>>>>>>>

MobileIAB-Supported ::= ENUMERATED {

 true,

 ...

}

MonitoringRequestonAvailableDataRate ::= SEQUENCE {

 monitoringRequest MonitoringRequest,

 dlAvailableDataRateReportThresholds AvailableDataRateReportThresholdList OPTIONAL,

-- The above IE shall be present if the Monitoring Request IE is set to the value “dl” or “both”

 ulAvailableDataRateReportThresholds AvailableDataRateReportThresholdList OPTIONAL,

-- The above IE shall be present if the Monitoring Request IE is set to the value “ul” or “both”

 iE-Extensions ProtocolExtensionContainer { { MonitoringRequestonAvailableDataRate-ExtIEs} } OPTIONAL,

 ...

}

MonitoringRequestonAvailableDataRate-ExtIEs NGAP-PROTOCOL-EXTENSION ::= {

 ...

}

MonitoringRequest ::= ENUMERATED {ul, dl, both, stop,...}

MRB-ID ::= INTEGER (1..512, ...)

<<<<<<<<<<<<<<<<<<<< Unaffected part is skipped >>>>>>>>>>>>>>>>>>>>

ReportArea ::= ENUMERATED {

 cell,

 ...

}

ReportingThreshold ::= INTEGER (0..FFS)

RepetitionPeriod ::= INTEGER (0..131071)

***-----------------Next Changes-------------------***

### 9.4.7 Constant Definitions

-- ASN1START

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

--

-- Constant definitions

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-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

<<<<<<<<<<<<<<<<<<<< Unaffected part is skipped >>>>>>>>>>>>>>>>>>>>

 maxnoofPartiallyAllowedS-NSSAIs INTEGER ::= 8

 maxnoofRSPPQoSFlows INTEGER ::= 2048

 maxnoofThresholds INTEGER ::= FFS

<<<<<<<<<<<<<<<<<<<< Unaffected part is skipped >>>>>>>>>>>>>>>>>>>>

 id-UserLocationInformationN3IWF-without-PortNumber ProtocolIE-ID ::= 439

 id-AUN3DeviceAccessInfo ProtocolIE-ID ::= 440

 id-MonitoringRequestonAvailableDataRate ProtocolIE-ID ::= b1

END

-- ASN1STOP

***-----------------End of the Changes-------------------***