**3GPP TSG-RAN WG3 #128 R3-253773**

**Malta, MT, 19th – 23th May 2025**

**Agenda item: 21.3**

**Source: Nokia, Nokia Shanghai Bell**

**Title: Summary of offline discussion on CB: # R19XR**

**Document for: Discussion and Decision**

# 1 Introduction

This contribution provides summary of offline discussion on CB: # R19XR.

**CB: # R19XR**

**- Work on the solution over F1 for UL rate control**

**- Check other open issues**

(moderator - Nok)

Summary of offline disc R3-253773

The offline discussion will have two phases:

* **Phase 1:** for the discussion on the questions. Please share your view on the questions **by 13:00 Wednesday May 21st (Malta time)**
* **Phase 2:** Based on the result of Phase 1, TPs will be prepared. Phase 2 will discuss the TPs.

# 2 For the Chair’s Notes

# 3 uplink congestion signalling

Online session agreed **CU sends the uplink rate control indication per QoS flow over F1 to DU.**

Further discussion on whether Other additional assistance information from CU to DU. Following options were proposed:

- Option 1: Recommended UL bit rate info per QoS flow

- Option 2: Measured bit rate per QoS flow

- Option 3: No additional information

**Please share your view on following questions:**

* **Q1-1:** Which option is your preference?
* **Q1-2:** The detailed content of “**uplink rate control indication per QoS flow**” in the agreement “**CU sends the uplink rate control indication per QoS flow over F1 to DU.**” The NGAP BL CR (R3-253121) includes following information for a QoS Flow. Can the F1AP **indication** be similar to NGAP *Indication of Bitrate Adaptation* IE, to Indicate that the QoS Flow allows rate adaptation in the indicated direction?

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Indication of Bitrate Adaptation | O |  | ENUMERATED (uplink, …) | Indicates that the QoS Flow allows rate adaptation in the indicated direction. | YES | ignore |

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| **Company Name** | **Answers to Questions** | **Comments** |
| **Nokia** | Q1-1: Opt 3(Opt 1 as a further optimization.)Q1-2: Yes | **For Q1-1:** We would consider Option 1 as a further optimization. In Option 1, the gNB-DU may only need to send MAC CEs when a specific recommended bitrate is met or not met, thus reduce the unnecessary MAC CEs to the UE. So we consider Option 1 is a further optimization to Option 3. In case majorities prefer Option 1, we can accept it as a WA, since its feasibility need to be confirmed by SA2/SA4, thus LS to SA2/SA4 is needed. For Option 2, we think the gNB-DU can determine the recommended bitrate, there is no need for the gNB-CU to provide the measured bitrate. **For Q1-2:** it is better to align with NGAP IE.  |
| **ZTE** | 1-1: Option 1, but also fine for Option 31-2: YES | **Q1-1:**We are ok for both option 1 and 3. We are also fine for rapporteur’s suggestion(further check SA WGs view on recommended bit rate).It is clear that option1 is the simplest alt on the table with the minimum spec impact. In addition, we also see the benefit to provide the recommended bit rate from CU to DU and/or from CN to RAN. As we always explained in contributions, the intention of this UL rate control function is to reduce/ relief the RAN load in advance. CU has a wider range for the RAN side state, hence, CU can provide the recommended bit rate to help the adaption of UL rate can cause minimum performance impact with the great load reduction at RAN side. Additionally, we believe RAN3 shall reply the received LS(R3-253014) from SA2. the information contained in this reply LS shall at least contain the following info:* From RAN3 view, whether both GBR and non-GBR flow can be supported for this function.
* Whether additional info except indication may be transmitted: between CU and DU and/or between CN and RAN and/or between UE and DU(info transmitted between DU and UE may be RAN2 scope?).

A draft reply LS has been prepared in our contribution[5] and wish to be considered as baseline. Detail content can be further checked in round 2.  |
| **Ericsson** | Q1-1: Opt 3Q1-2: Yes | **No need for additional signalling**, as we have agreed that the solution is based on a NW implementation where the DU reads the SDAP header to calculate the QoS Flow bit rate and sends MAC CE to the UE indicating bit adaptation. Any other option will trigger additional RAN3 impacts (F1/NG/Xn : Option 1; F1/E1/Xn: Option2). CU signals over F1 to the DU the information received from the CN concerning the QoS Flows that are subject to rate adaptation |
| **Huawei** | Q1-1: Opt 3Q1-2: Yes | We share the view as Ericsson, Option 3 is feasible and the simplest solution. Other solutions will require additional impact to E1 and F1 interface. |
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**Summary:**

**Potential Proposals:**

# 4 Support of exposure of available bitrate

# **non-homogeneous deployment**

Contribution ([16]) proposes gNB report the following status to the CN.

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| --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description |
| **Available Data Rate Reporting Status Item** |  | *1..<maxnoofQoSFlows>* |  |  |
| >QoS Flow Identifier | M |  | 9.3.1.51 |  |
| >Activation Status Uplink | M |  | ENUMERATED (active, not Active, …) | Indicates whether Available data rate reporting in UL is active or not active. |
| >Activation Status Downlink | M |  | ENUMERATED (active, not Active, …) | Indicates whether Available data rate reporting in DL is active or not active. |

**Q2-1: Please share your view on whether the gNB need to report the status of Available Bitrate monitoring. If yes, whether ok for above definition.**

**Encoding of available bitrate/threshold/maxnoofThresholds**

Moderator suggest to align with CT4 TS 29.244:

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| --- | --- | --- | --- |
|  |  | Bits |  |
|  | Octets | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
|  | 1 to 2 | Type = 348 (decimal) |  |
|  | 3 to 4 | Length = n |  |
|  | 5 | Spare | ULDR | DLDR | ULCI | DLCI |  |
|  | m to (m+1) | DL Congestion information threshold |  |
|  | p to (p+1) | UL Congestion information threshold |  |
|  | q to (q+**4**) | DL Data Rate threshold |  |
|  | r to (r+**4**) | UL Data Rate threshold |  |
|  | s to (n+4) | These octet(s) is/are present only if explicitly specified |  |

Figure 8.2.240-1: Reporting Thresholds

The Downlink Data Rate threshold field and the Uplink Data Rate threshold field shall be encoded as **kilobits per second** (1 kbps = 1000 bps) in binary value (rounded upwards).

For maxnoofThresholds, companies propose to use value “8”.

**Q2-2: Please share your view on following:**

* **align with TS29.244 for the encoding of available bitrate/threshold, i.e. define available bitrate and threshold as a 32-bit integer with unit kbps.**
* **Use value “8” for maxnoofThresholds.**

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| **Company Name** | **Answers to Questions** | **Comments** |
| **Nokia** | Q2-1: refer to commemtsQ2-2: Yes | For Q2-1, we do not see the strong need for reporting the status, since SA2/CN does not require it. But if majorities prefer, we can accept it.  |
| **ZTE** | Q2-1: no see any solid reason to introduce the deactivateQ2-2: see comments | **Q2-1:** As explained during online session, we do not see why we need the codepoint “deactivate” for this function. Hence, we prefer to introduce 1 bit indicator to let CN know this available data rate is supported and activated at RAN side.**Q2-2:**For the threshold number, 8 is ok. We also prefer to use this one in our discussion paper.For the value of available bit rate threshold, we wonder whether we can directly use the existing Bit Rate IE in RAN3 spec. Also fine to follow majority if most companies prefer to use bps. |
| **Ericsson** | Q2-1: Yes | **Q 2-1:**Thank you for the offline, we think this indicator is beneficial because it aligns with ECN Marking/Congestion reporting, where SMF knows whether the RAN has activated it or not. This varies based on RAN load and radio conditions. And this gives visibility to CN whether the threshold requirements are too stringent for RAN.On the “deactivate” codepoint, when the SMF learns that the target NG-RAN does not activate available bit reporting anymore, the SMF indicates this to the UPF, this will trigger UPF to send a specific report, to the AF/NEF, that the last reported available bitrate is no longer valid since the NG-RAN cannot report anymore. When the NG-RAN sends “activate” again, then the CN knows it is a new valid available bitrate.SA2 should be thanking us !😊**Q2-2:**Looks ok. |
| **Huawei** | Q2-1: See commentsQ2-2: See comments | Q2-1: We do not see strong motivation for the status report, but can accept it if majority prefers to have. If the status report is needed, better to have both “activated” and “deactivated” codepoints.Q2-2:* 32-bit integer with unit kbps will represents a real large value (~ 4000000000 kbps=4000Gbps). It is hard to imagine which traffic can achieve such high data rate… And, we doubt the necessity to use 1kbps as the step for bit rate adjustment, 1Mbps should be fine enough. May I suggest to use 2 Octects for the available bitrate/threshold, and use Mbps as the unit, this is helpful for saving overhead for User plane packets.
* Use value “8” for maxnoofThresholds is fine for us.

[**Moderator**]: I can understand your comment. But you may noticed the bitrate defined in NGAP (and other AP specs) support up to 4Tbps. This was a request from SA/CT. (LTE introduced the 4T in the *Extended Bit Rate* IE. NR support the 4T Bitrate from the beginning). To simplify the design, I proposed to align with CT4 spec (or reference to Bit Rate IE) to support up to 4T. |
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**Summary:**

**Potential Proposals:**

# 5 BSSize and TTNB

According to the contributions, it seems no objection for adding BSSize and TTNB into the DL PDU SESSION INFORMATION frame defined in TS 38.415 and the DL USER DATA frame defined in TS 38.425.

So Moderator propose to remove the following ENs from TS 38.415/425 BL CRs, i.e.

* **For TS 38.415 TP, remove following EN**

Editor’s Note: FFS on whether TTNB and/or BSSize related information may be removed in this clause and introduced into other frame(e.g. DL PDU SET INFORMATION).

* **For TS 38.425 TP, remove following EN**

Editor Note: FFS whether to capture the Burst Size and Time To Next Burst related information in the DL USER DATA frame.

**Q3-1: Please share your view on removing above ENs from TS 38.415/425 BL CRs.**

Contribution ([10]) proposes following TP for TS 37.340 BL CR:

When the PDCP hosting gNB receives the Data Burst Size Indication or the Time To Next Burst Indication from the UPF, it always provides the Data Burst Size Indication or the Time To Next Burst Indication to the corresponding node when data transmission from the PDCP hosting node to the corresponding node is needed for the Data Burst.

**Q3-2: Please share your view on above TP for TS 37.340 BL CR.**

Contribution ([26][27]) proposes TS 38.420/470 TPs.

**Q3-3: Please share your view on TS 38.420/470 TPs in Contribution ([26][27]).**

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| **Company Name** | **Answers to Questions** | **Comments** |
| **Nokia** | Q3-1: YesQ3-2: YesQ3-3: Yes |  |
| **ZTE** | Q3-1:YESQ3-2: YESQ3-3: YES | **Q3-3:**It is obvious that the description for end of data burst information in a frame has been added into the 420 and 470 accordingly. Based on this legacy mechanism, we also prefer to introduce the new added data burst information to the same spec. |
| **Ericsson** | Q3-1: YesQ3-2: YesQ3-3: Yes |  |
| **Huawei** | Q3-1: YesQ3-2: YesQ3-3: See comment | Q3-3: The motivation needs more clarification. Since we agreed that the TTNB and Burst Size will be included in DL User Data frames in F1-U (38.425), and the general description for referring 38.425 captured in clause 8.5. So, the current 38.470 spec is enough. Same situation for TS 38.420 which also contains clause 8.5 for referring TS 38.425 for Xn-U.Thus, the proponents please clarify why the section 8.5 in the two specs are not enough. 8.5        NG-RAN F1 interface: user plane protocol (3GPP TS 38.425)3GPP TS 38.425 [7] specifies the user plane protocol being used over the F1-U interface.  |
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**Summary:**

**Potential Proposals:**

# 6 Support of PDU Set AQP

Contribution ([14]) propose following proposal:

**Proposal: An abnormal condition text is needed to capture that if the NG-RAN receives the PSQP in AQP but the PSQP are absent in the QoS flow parameters, the procedure should fail.**

**Q4: Please share your view on above proposal.**

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| **Company Name** | **Answers to Questions** | **Comments** |
| **Nokia** | Yes |  |
| **ZTE** | Yes |  |
| **Ericsson** | Yes |  |
| **Huawei** | Prefer another way, see comment | We do not think NG-RAN should fail the PDU session establishment/modification in such abnormal case (PDU set QoS not included in the QoS flow level QoS but included in AQP). To my understanding, this IE is not so critical. An alternative way is that RAN just ignore the PSDB and PSER in AQP if the configuration is abnormal, then we can add some semantics description in the 9.3.1.151 Alternative QoS Parameters Set List for clarification. For example, for the *PDU Set Delay Budget Downlink*, add such clarification in semantics : This IE is included if the *PDU Set Packet Delay Budget* IE in the *DL PDU Set QoS Information* IE is present and is ignored otherwise.Please note that we have such kind of handling in many cases, e.g., MDBV is only needed for the delay critical traffic, if this IE is included wrongly for non-delay critical QoS flow, the RAN should ignore the IE rather than fail the procedure.  |
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**Summary:**

**Potential Proposals:**

# 7 On RLC retransmission enhancements

**For Unnecessary RLC retransmission avoidance:**

Contribution ([7]) propose following proposal:

**Proposal 3: Introduce a new IE in the DL USER DATA frame specifically indicates the PDCP PDU associated with an RLC SDU, or a segment of the RLC SDU, for which the transmission and retransmission should be stopped.**

**Q5-1: Please share your view on above proposal.**

**For Timely RLC retransmission:**

Contribution ([7]) propose following proposal:

**Proposal 1: For uplink, the gNB-CU sends the PDCP Discard Timer value and PSI based discard timer value (if configured) of a DRB to the gNB-DU so that gNB-DU can then configure the autonomous retransmission and/or enhanced polling thresholds for the DRB.**

**Proposal 2: For downlink, RAN3 discusses the signalling enhancement between CU and DU to support timely retransmission.**

**Q5-2: Please share your view on above proposal.**

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| **Company Name** | **Answers to Questions** | **Comments** |
| **Nokia** | Q5-1: noQ5-2: see comments | For Q5-1: we are not sure why current discard mechanism in F1-U does not work for this case. Please clarify the reason. For Q5-2: it may be needed, but we prefer to wait for RAN2 progress.  |
| **ZTE** | See comments | For this topic, considering RAN2 is disucssing this topic in ongoing meeting which may have extra RAN3 impact. We are fine to wait for RAN2 progress. Further enhancement will be addressed in next meeting if needed. |
| **Ericsson** | See comments | Same view as Nokia |
| **Huawei** | Q5-1: see commentQ5-2: see comment | Q5-1: We prefer to reuse the legacy discard indication in F1, and update the TS 38.425 as needed.Q5-2: we acknowledge the issue in P1, but not sure RAN2 will update the design of RRC signalling.Q5-2: Agree |
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**Summary:**

**Potential Proposals:**

# 8 MMSID

Contribution ([28]) propose following proposal:

**Proposal 10: The MMSID is defined as OCTET STRING (SIZE (1)).**

**Q6: Please share your view on above proposal.**

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| **Company Name** | **Answers to Questions** | **Comments** |
| **Nokia** | Yes |  |
| **ZTE** | YES |  |
| **Ericsson** | Yes |  |
| **Huawei** | Agree |  |
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**Summary:**

**Potential Proposals:**

# 9 Other issues

Please add any missing issues.

**Issue #: (Company) description of the issues**

**Issue #1:**

# References

1. R3-253014, LS reply on uplink rate control (SA2(vivo)) LS in
2. R3-253035, LS on the accuracy of PDU Set size and data burst size indication (SA4(Qualcomm)) LS in
3. R3-253036, LS on Indicating Time to the Next Data Burst (TTNB) (SA4(Qualcomm)) LS in
4. R3-253396, Discussion on the remaining issues of Rel-19 XR (Nokia, Nokia Shanghai Bell) other
5. R3-253728, Further discussion on XR uplink rate control with LS and TP to BLCR for 38473 (ZTE Corporation) other
6. R3-253264, Discussion on XR rate control (vivo) discussion
7. R3-253332, (TP to XR BL CR for 38.473) On RLC retransmission enhancements (Lenovo) other
8. R3-253333, Discussion on Uplink Bit Rate Control (Lenovo) discussion
9. R3-253348, (TP for XR BL CR for TS 38.473) Support of UL rate control (Huawei) other
10. R3-253349, (TP for XR BL CRs) Discussion on the miscellaneous issues for XR (Huawei) other
11. R3-253397, (TP to BL CR for TS 38.415, TS 38.425 and TS 38.413) Update for BSSize/TTNB and available data rate exposure (Nokia, Nokia Shanghai Bell) other
12. R3-253445, Discussion on NR XR Enhancements for others (CATT) discussion
13. R3-253446, (TP for XR BL CR to 38.413) Support of XR enhancements (CATT) other
14. R3-253463, (TP for XR BL CR for TS38.413) Support of PDU Set AQP (Ericsson, Qualcomm Inc., Nokia, Nokia Shanghai Bell) other
15. R3-253464, Discussion on XR UL bit rate control (Ericsson) discussion
16. R3-253465, [TP to XR BL CR for 38.413] RAN activation and support of Available data rate reporting (Ericsson, China Telecom) other
17. R3-253521, Support of Uplink Rate Control for XR (Ofinno, LLC) discussion
18. R3-253564, R19 XR Signaling Enhancements (Qualcomm Incorporated) discussion
19. R3-253617, (TP for XR BL CR for TS 38.300) Support of UL rate control (Huawei, CMCC, China Telecom) other
20. R3-253641, Discussion on other aspects for NR XR enhancements (Samsung) discussion
21. R3-253642, (TP to BLCR for TS 38.473) NR XR enhancements (Samsung) other
22. R3-253666, Discussion on Rate Control for XR (China Telecom) discussion
23. R3-253669, Support of Exposure of Available Data Rate in Non-Homogeneous Deployment (CMCC) discussion
24. R3-253670, Support of Uplink Congestion Signaling (CMCC) discussion
25. R3-253702, Discussion on XR RAN Awareness and UL Rate Control (Meta) discussion
26. R3-253729, [TP to XR BL CR for 38.420] Dynamic traffic characteristics change (ZTE Corporation, Ericsson, CMCC, Nokia, Nokia Shanghai Bell, China Telecom, Qualcomm) other
27. R3-253730, [TP to XR BL CR for 38.470] Dynamic traffic characteristics change (ZTE Corporation, Ericsson, CMCC, Nokia, Nokia Shanghai Bell, China Telecom, Qualcomm) other
28. R3-253731, [TP for XR BL CRs to 38.413, 38.423, 38.473, 37.483, 38.415, 38.425] Discussion on Rel-19 XR enhancement with ultimate all in one TP (ZTE Corporation) other