**3GPP TSG-RAN WG3 Meeting #127bis R3-252304**

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

**Agenda item: 21.3**

**Source: Nokia, Nokia Shanghai Bell**

**Title: Summary of offline discussion on XR**

**Document for: Discussion and Decision**

# 1 Introduction

This contribution provides summary of offline discussion on contributions under AI 21.3 on NR XR.

# 2 For the Chair’s Notes

**For support of DL PDU Set marking without PDU Set QoS**

Proposal 3-1: from SMF to gNB direction: introduce *DL PDU Set Information Marking Support Indication* IE in the *QoS Flow Level QoS Parameters* IE. This indication is also provided to target gNB over XnAP.

Proposal 3-2: from gNB to SMF direction: reuse existing *PDU Set based Handling Indicator* IE.

**For support alternative PDU Set QoS:**

Proposal 3-3: Add UL PSDB, DL PSDB, UL PSER and DL PSER in Alternative QoS Parameter Set List IE in NGAP/XnAP/F1AP/E1AP.

Proposal 3-4: Add new codepoints “not fulfilled DL” and “not fulfilled UL” in the Notification information/cause IE in NGAP/XnAP/F1AP.

**For QoS Handling when Traffic Characteristics Change Dynamically**

Proposal 4: introduce BSSize and TTNB in NG-U/F1-U/XN-U. FFS on specific container/frame to be used.

FFS on impact to TS 38.420/470

**For Support of exposure of available data rate:**

Proposal 5-1: Introduce thresholds and direction to trigger NG-RAN monitor available data rate in NGAP/XnAP/F1AP/E1AP.

Proposal 5-2: Introduce “available data rate” in TS 38.425 and TS 38.415.

FFS on non-homogeneous deployment.

**For Support for ECN marking status change**

Proposal 6: agree TP based on R3-251854

**For Support and specify multi-modality awareness for QoS flows in both DL and UL RAN:**

Proposal 1-1: introduce MMSID in NGAP, XnAP, F1AP and E1AP

Proposal 1-2: discuss the gNB behavior and capture the gNB behavior in Stage-2 TP.

**For Specify uplink congestion signalling:**

Proposa1 2-1: introduce an indication in NGAP, to allow the SMF to inform the gNB which QoS flow(s) are subject to uplink rate control.

Proposal 2-2: introduce the same indication in XnAP to inform target gNB.

FFS on per QoS flow indication or per DRB indication over F1AP.

FFS on whether CN may inform gNB the recommended UL rate for specific QoS flows.

**For avoid RLC unnecessary retransmission**

FFS on whether the gNB-CU sends an indication to the gNB-DU to stop the transmission and retransmission of a RLC SDU or the segment of a RLC SDU.

# 3 Support and specify multi-modality awareness for QoS flows in both DL and UL RAN

**Proposal 1-1: introduce MMSID in NGAP, XnAP, F1AP and E1AP**

**The TPs will be drafted based on following:**

R3-251855 (TP for XR BL CR for TS38.413) Addition of MMSID (Huawei, Ericsson, ZTE, Qualcomm, CMCC, Nokia, Nokia Shanghai Bell, CATT, China Telecom, Lenovo)

R3-252029 TP for XR BL CR for TS38.423) Addition of MMSID (Ericsson, Qualcomm, Huawei, CMCC, ZTE, Nokia, Nokia Shanghai Bell, CATT, China Telecom, Lenovo)

R3-252161 [TP for XR BL CR for TS 37.483] Addition of MMSID (ZTE Corporation, Ericsson, China Telecom, Qualcomm Incorporated, CMCC, CATT, Huawei, Nokia, Nokia Shanghai Bell, Lenovo)

R3-252038 (TP to BL CR for TS 38.473) Addition of MMSID (CMCC, Ericsson, Huawei, ZTE, CATT, Nokia, Nokia Shanghai Bell, Qualcomm, China Telecom, Lenovo)

**Proposal 1-2: discuss the gNB behavior and capture the gNB behavior in Stage-2 TP.**

**The TPs will be drafted based on following:**

* R3-251673 Discussion on MMSID reception in gNB (NEC)
* R3-251734 (TP to BL CR for TS 38.300) Addition of MMSID (Nokia, Nokia Shanghai Bell, Huawei, CMCC, ZTE, Lenovo)

# 4 Specify uplink congestion signalling

Moderator suggest to agree the following:

**Proposa1 2-1: introduce an indication in NGAP, to allow the SMF to inform the gNB which QoS flow(s) are subject to uplink rate control.**

**Proposal 2-2: introduce the same indication in XnAP.**

**Other topics (e.g. per QoS flow indication or per DRB indication over F1) needs to be discussed online.**

**FFS on whether CN may inform gNB the recommended UL rate for specific QoS flows.**

# 5 Support of PDU set based QoS handling enhancement

**For support of DL PDU Set marking without PDU Set QoS**

**Proposal 3-1: from SMF to gNB direction: introduce *DL PDU Set Information Marking Support Indication* IE in the *QoS Flow Level QoS Parameters* IE. This indication is also provided to target gNB over Xn.**

**Proposal 3-2: from gNB to SMF direction: reuse existing *PDU Set based Handling Indicator* IE.**

**For support alternative PDU Set QoS:**

**Proposal 3-3: Add UL PSDB, DL PSDB, UL PSER and DL PSER in Alternative QoS Parameter Set List IE in NG/Xn/F1/E1.**

**Proposal 3-4: Add new codepoints “not fulfilled DL” and “not fulfilled UL” in the Notification information/cause IE in NG/Xn/F1.**

**The TPs will be drafted based on following:**

* R3-251781 (TP to XR BL CR for 38.423) Support of PDU set based QoS handling enhancement (CATT, Nokia, Nokia Shanghai Bell, CMCC, Huawei)
* R3-251735 (TP to BL CR for TS 38.413) enhancement for DL PDU Set marking without PDU Set QoS, and Alternative PDU Set QoS with PSDB and PSER (Nokia, Nokia Shanghai Bell, CMCC, Huawei, CATT)
* R3-252142 (TP for XR BL CR for TS 38.473) Support of PDU set based QoS handling enhancement (Huawei, Nokia, Nokia Shanghai Bell, CMCC, CATT)
* R3-252039 (TP to BL CR for TS 37.483) Support of Alternative PDU Set QoS (CMCC, Nokia, Nokia Shanghai Bell, Huawei, CATT, Xiaomi)
* TP to BL CR for for TS 37.340 based on R3-251632 Support of Alternative PDU Set QoS for XR in DC scenario

# 6 QoS Handling when Traffic Characteristics Change Dynamically

**Proposal 4: introduce BSSize and TTNB in NG-U/F1-U/XN-U. FFS on specific container/frame to be used.**

**FFS on stage-2 38.420/470**

**The TPs will be drafted based on following:**

* R3-251738 (TP to BL CR for TS 38.300) Support for Burst Size and TTNB (Nokia, Nokia Shanghai Bell)
* R3-252108 (TP to TS 38.415) enhancement for BSSize, TTNB and available data rate (China Telecom, Nokia, Nokia Shanghai Bell)

# 7 Support of exposure of available data rate

**Proposal 5-1: Introduce thresholds and direction to trigger NG-RAN monitor available data rate NG/Xn/F1/E1.**

**Proposal 5-2: Introduce “available data rate” in 38.425 and 38.415.**

**FFS on non-homogeneous deployment.**

**The TPs will be drafted based on following:**

R3-251736 (TP to BL CR for TS 38.413) enhancement for available data rate report (Nokia, Nokia Shanghai Bell, CMCC, Huawei, CATT)

R3-251782 (TP to XR BL CR for 38.423) Support of available data rate report (CATT, Nokia, Nokia Shanghai Bell, CMCC, Huawei)

R3-252040 (TP to BL CR for TS 37.483) Support of Available Data Rate Report (CMCC, Nokia, Nokia Shanghai Bell, Huawei, CATT, Xiaomi)

R3-252143 (TP for XR BL CR for TS 38.473) Support of available data rate report (Huawei, Nokia, Nokia Shanghai Bell, CMCC, CATT)

R3-252162 [TP for XR BL CR for TS 38.300, 38.413, 38.423, 38.473,37.483,38.415, 38.425, 38.420, 38.470] Rel-19 additional XR enhancements (ZTE Corporation)

R3-252036 (TP to BL CR for TS 38.415 ) Support of QoS Handling Enhancement and Exposure of Available Data Rate (CMCC)

# 8 Support for ECN marking status change

**Online discussion on Proposal 6: agree TP based on R3-251854**

R3-251854 (TP for XR BL CR for TS 37.340) Support for ECN marking status change (Huawei, CMCC, CATT, Nokia, Nokia Shanghai Bell, BT, Vodafone, ZTE, Lenovo)

# 9 avoid RLC unnecessary retransmission

**To support unnecessary RLC retransmission avoidance, FFS on whether the gNB-CU sends an indication to the gNB-DU to stop the transmission and retransmission of a RLC SDU or the segment of a RLC SDU.**

# References

1. R3-251856 Discussion on multi-modality awareness and UL rate control (Huawei)
2. R3-251780 Disccsion on NR XR Enhancements for others (CATT)
3. R3-251834 Discussion on XR rate control (vivo)
4. R3-252227 Discussion on XR UL Rate Control (Meta)
5. R3-252031 Discussion on XR Bitrate control over F1 (Ericsson)
6. R3-252250 Discussion on Rate Control Singalling over F1 Interface (China Telecom)
7. R3-252162 [TP for XR BL CR for TS 38.300, 38.413, 38.423, 38.473,37.483,38.415, 38.425, 38.420, 38.470] Rel-19 additional XR enhancements (ZTE Corporation)
8. R3-252160 Discussion on XR Enhancement with draft reply LS (ZTE Corporation)
9. R3-251737 [DRAFT] Reply LS on LS on uplink rate control (Nokia, Nokia Shanghai Bell)
10. R3-251523 LS reply on multi-modality awareness (SA2(Chinamobile))
11. R3-251733 Discussion on the new RAN3 related objectives (Nokia, Nokia Shanghai Bell)
12. R3-251846 Discussion on other aspects for NR XR enhancements (Samsung)
13. R3-251734 (TP to BL CR for TS 38.300) Addition of MMSID (Nokia, Nokia Shanghai Bell, Huawei, CMCC, ZTE, Lenovo)
14. R3-251855 (TP for XR BL CR for TS38.413) Addition of MMSID (Huawei, Ericsson, ZTE, Qualcomm, CMCC, Nokia, Nokia Shanghai Bell, CATT, China Telecom, Lenovo)
15. R3-252029 TP for XR BL CR for TS38.423) Addition of MMSID (Ericsson, Qualcomm, Huawei, CMCC, ZTE, Nokia, Nokia Shanghai Bell, CATT, China Telecom, Lenovo)
16. R3-252161 [TP for XR BL CR for TS 37.483] Addition of MMSID (ZTE Corporation, Ericsson, China Telecom, Qualcomm Incorporated, CMCC, CATT, Huawei, Nokia, Nokia Shanghai Bell, Lenovo)
17. R3-252038 (TP to BL CR for TS 38.473) Addition of MMSID (CMCC, Ericsson, Huawei, ZTE, CATT, Nokia, Nokia Shanghai Bell, Qualcomm, China Telecom, Lenovo)
18. R3-251673 Discussion on MMSID reception in gNB (NEC)
19. R3-251674 MMSID reception in gNB (NEC)
20. R3-252226 Discussion on Multi-modality Awareness for XR (Meta)
21. R3-251736 (TP to BL CR for TS 38.413) enhancement for available data rate report (Nokia, Nokia Shanghai Bell, CMCC, Huawei, CATT)
22. R3-251782 (TP to XR BL CR for 38.423) Support of available data rate report (CATT, Nokia, Nokia Shanghai Bell, CMCC, Huawei)
23. R3-252040 (TP to BL CR for TS 37.483) Support of Available Data Rate Report (CMCC, Nokia, Nokia Shanghai Bell, Huawei, CATT, Xiaomi)
24. R3-252143 (TP for XR BL CR for TS 38.473) Support of available data rate report (Huawei, Nokia, Nokia Shanghai Bell, CMCC, CATT)
25. R3-252036 (TP to BL CR for TS 38.415 ) Support of QoS Handling Enhancement and Exposure of Available Data Rate (CMCC)
26. R3-251854 (TP for XR BL CR for TS 37.340) Support for ECN marking status change (Huawei, CMCC, CATT, Nokia, Nokia Shanghai Bell, BT, Vodafone, ZTE, Lenovo)
27. R3-251781 (TP to XR BL CR for 38.423) Support of PDU set based QoS handling enhancement (CATT, Nokia, Nokia Shanghai Bell, CMCC, Huawei)
28. R3-251735 (TP to BL CR for TS 38.413) enhancement for DL PDU Set marking without PDU Set QoS, and Alternative PDU Set QoS with PSDB and PSER (Nokia, Nokia Shanghai Bell, CMCC, Huawei, CATT)
29. R3-252142 (TP for XR BL CR for TS 38.473) Support of PDU set based QoS handling enhancement (Huawei, Nokia, Nokia Shanghai Bell, CMCC, CATT)
30. R3-251757 R19 XR Signaling Enhancements (Qualcomm Incorporated)
31. R3-251631 Support of Multi-Modality Awareness for XR (Ofinno, LLC)
32. R3-251632 Support of Alternative PDU Set QoS for XR in DC scenario (Ofinno, LLC)
33. R3-251738 (TP to BL CR for TS 38.300) Support for Burst Size and TTNB (Nokia, Nokia Shanghai Bell)
34. R3-251830 Discussion on Multimodality and uplink congestion (CANON Research Centre France)
35. R3-251833 Discussion on multi-modality awareness for QoS flows (vivo)
36. R3-251847 (TP to BLCR for TS 38.473) NR XR enhancements (Samsung)
37. R3-251857 (TP for XR BL CRs) Discussion on the miscellaneous issues for XR (Huawei)
38. R3-251954 Discussion on XR Enhancements (Lenovo)
39. R3-251955 Discussion on bit rate control and unnecessary retransmission (Lenovo)
40. R3-252030 (TP for XR BL CR for TS38.413) Support of PDU Set QoS enhancement (Ericsson)
41. R3-252037 Support of Uplink Congestion Signalling and PDU Set Based QoS Handling Enhancement (CMCC)
42. R3-252039 (TP to BL CR for TS 37.483) Support of Alternative PDU Set QoS (CMCC, Nokia, Nokia Shanghai Bell, Huawei, CATT, Xiaomi)
43. R3-252108 (TP to TS 38.415) enhancement for BSSize, TTNB and available data rate (China Telecom, Nokia, Nokia Shanghai Bell)