**3GPP TSG RAN Meeting #102 RP-232988**

**Edinburgh, Scotland, December 11-15, 2023**

**Agenda Item:**  **9.3.2.9**

**Source: Nokia (Rapporteur)**

**Title:** **Summary for WI** **XR Enhancements**

**WI code(s): NR\_XR\_enh-Core**

**leading WG: RAN2**

**Release: Rel-18**

### 1 Introduction

The RAN Study Item on *XR Enhancements for* NR had identified several enhancements for the support for XR services in NG-RAN. This work item specified those enhancements, which revolve around three main areas: awareness, power saving, and capacity. It complements the work done by SA2 on *Architecture Enhancements for XR (Extended Reality) and media service*, and the work done by SA4 on *Traffic Models and Quality Evaluation Methods for Media and XR Services in 5G Systems*, *Immersive Real-time Communication for WebRTC* (iRTCW), *Media Capabilities for Augmented Reality* (MeCAR), *IMS-based AR Conversational Services* (IBACS), *Terminal Audio quality performance and Test methods for Immersive Audio Services*, *Split Rendering Media Service Enabler* (SR\_MSE), and *Real-time Transport Protocol Configurations*.

### 2 Description

For XR Awareness, in addition to the assistance information provided by 5GC to the gNB (PDU Set Information and traffic assistance information), the following is introduced in order to enhance the scheduling of uplink resources by NG-RAN:

- One additional buffer size table to reduce the quantisation errors in BSR reporting (e.g. for high bit rates);

- A new MAC CE for the Delay Status Report (DSR) of buffered data;

- Reporting of uplink assistance information (jitter range, burst arrival time, UL data burst periodicity) per QoS flow by the UE via UE Assistance Information.

For power saving enhancements, the gNB may configure a DRX cycle expressed in rational numbers so that the DRX cycle matches the periodicities of video frame rates (15, 30, 45, 60, 72, 90 and 120 fps). In addition, configured grants may be configured without the need for the UE to monitor possible UL retransmissions, thus increasing the number of power saving opportunities for the UE.

For capacity enhancements, configured grant-based PUSCH transmission are enhanced with the following:

- Support of multiple CG PUSCH transmission occasions within a single period of a CG configuration;

- Indication of unused CG PUSCH occasion(s) of a CG configuration with Uplink Control Information multiplexed in CG PUSCH transmission of the CG configuration.

Also, in uplink, the UE may be configured with PDU Set based discard operation for a specific DRB. When configured, the UE discards all packets in a PDU set when one PDU belonging to this PDU set is discarded. This is used when the remaining PDUs of that PDU Set can be considered as no longer needed by the application, as indicated by the PDU Set Integrated Handling Information (PSIHI) obtained by 5GC for that QoS flow.

In addition, in case of congestion, the gNB may use the PDU Set Importance (PSI) of the GTP-U header for PDU set discarding. For uplink, dedicated downlink signalling is used to request the UE to apply a shorter discard timer to low importance SDUs in PDCP.

### 3 References

[1] RP-232778, Updated WID on XR Enhancements for NR

[2] RP-232779, Status Report on XR Enhancements for NR