**3GPP TSG RAN Meeting #102 RP-232778**

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

**Source: Nokia (Rapporteur)**

**Title: Updated WID on XR Enhancements for NR**

**Document for: Approval**

**Agenda Item: 9.3.2.9**

3GPP™ Work Item Description

Information on Work Items can be found at <http://www.3gpp.org/Work-Items>
See also the [3GPP Working Procedures](http://www.3gpp.org/specifications-groups/working-procedures), article 39 and the TSG Working Methods in [3GPP TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm)

Title: XR Enhancements for NR

Acronym: NR\_XR\_enh-Core

Unique identifier: 981039

|  |  |
| --- | --- |
| **This WID includes a Core part** | **X** |
| **This WID includes a Performance part** |  |

Potential target Release: *Rel-18*

# 1 Impacts

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Affects:** | UICC apps | ME | AN | CN | Others (specify) |
| **Yes** |  | x | x |  |  |
| **No** | x |  |  | x |  |
| **Don't know** |  |  |  |  |  |

# 2 Classification of the Work Item and linked work items

### 2.1 Primary classification

This work item is a:

|  |  |
| --- | --- |
| X | Feature |
|  | Building Block |
|  | *Work Task* |
|  | Study Item |

### 2.2 Parent Work Item

|  |
| --- |
| Parent Work / Study Items  |
| Acronym | Working Group | Unique ID | Title (as in 3GPP Work Plan) |
| NR\_XR\_enh | RAN2 | 981039 | XR (eXtended Reality) enhancements for NR |

### 2.3 Other related Work Items and dependencies

|  |
| --- |
| Other related Work/Study Items (if any) |
| **Acronym** | Unique ID | Title | Nature of relationship |
| FS\_NR\_XR\_enh | 940087 | Study on XR (eXtended Reality) enhancements for NR [FS\_NR\_XR\_enh] | NR\_XR\_enh is a follow-up WI of REL-18 SI FS\_NR\_XR\_enh (SI TR 38.835) |
| FS\_NR\_XR\_eval | 860062 | Study on XR (Extended Reality) evaluations for NR[FS\_NR\_XR\_eval] | related REL-17 SI (SI TR 38.838) |
| XRM | 980016 | Architecture Enhancements for XR (Extended Reality) and media service | Will specify the SA2 components |

# 3 Justification

The RAN Study Item on *XR Enhancements for* NR has identified several enhancements for the support for XR services. This work item aims at specifying those enhancements.

# 4 Objective

### 4.1 Objective of SI or Core part WI or Testing part WI

Specify the enhancements related to power saving:

- DRX support of XR frame rates corresponding to non-integer periodicities (through at least semi-static mechanisms e.g. RRC signalling) (RAN2).

Specify the enhancements related to capacity:

- Multiple Configured Grant (CG) PUSCH transmission occasions in a period of a single CG PUSCH configuration (RAN1, RAN2);

- Dynamic indication of unused CG PUSCH occasion(s) based on Uplink Control Information (UCI) by the UE (RAN1, RAN2);

- Buffer Status Report (BSR) enhancements including at least new Buffer Status Table(s) (RAN2);

- Delay reporting of buffered data in uplink (RAN2);

- Discard operation of PDU Sets for DL and UL (RAN2, RAN3);

Specify the enhancements for XR Awareness:

- Signalling by CN of semi-static information per QoS flow (e.g. PDU set QoS parameters), dynamic information per PDU set (PDU Set information and Identification) and End of Data Burst indication (RAN3, RAN2);

- Impact of identifying by UE of PDU Sets, Data bursts and PSI, as needed (RAN2);

- Provisioning by UE of XR traffic assistance information e.g. periodicity, UL traffic arrival information (RAN2, RAN3);

- Support signalling the congestion information from RAN to the CN in alignment with SA2 (RAN3);

### 4.2 Objective of Performance part WI

NOTE: Leave empty if the WI proposal does not contain a RAN performance part.

### 4.3 RAN time budget request (not applicable to RAN5 WIs/Sis)

’Original TU request: see WID RP-223502; for potential updates see WI status reports submitted to TSG RAN.

# 5 Expected Output and Time scale

|  |
| --- |
| **Impacted existing TS/TR** *{One line per specification. Create/delete lines as needed}* |
| TS/TR No. | Description of change  | Target completion plenary# | Remarks |
| 38.300 | Stage 2 Description of XR Enhancements | TSG#102 |  |
| 38.321 | MAC aspects of XR Enhancements | TSG#102 |  |
| 38.323 | PDCP aspects of XR Enhancements | TSG#102 |  |
| 38.331 | Control Plane aspects of XR Enhancements | TSG#102 |  |
| 38.306 | Capabilities of XR Enhancements | TSG#102 |  |
| 38.211 | Physical channels and modulation aspects of XR Enhancements | TSG#102 |  |
| 38.212 | Multiplexing and channel coding aspects of XR Enhancements | TSG#102 |  |
| 38.213 | Physical layer procedures aspects of XR Enhancements (for control) | TSG#102 |  |
| 38.214 | Physical layer procedures aspects of XR Enhancements (for data) | TSG#102 |  |
| 38.413 | NG-RAN; NG Application Protocol (NGAP) | TSG#102 |  |
| 38.415 | NG-RAN; PDU session user plane protocol | TSG#102 |  |
| 38.423 | NG-RAN; Xn Application Protocol (XnAP) | TSG#102 |  |
| 38.425 | NG-RAN; NR user plane protocol | TSG#102 |  |
| 38.473 | NG-RAN; F1 Application Protocol (F1AP) | TSG#102 |  |
| 37.483 | E1 Application Protocol (E1AP) | TSG#102 |  |
| 38.410 | NG-RAN; NG general aspects and principles | TSG#102 |  |
| 38.420 | NG-RAN; Xn general aspects and principles | TSG#102 |  |
| 38.470 | NG-RAN; F1 general aspects and principles | TSG#102 |  |

NOTE: If this is a RAN WI including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Remarks for each spec.
If an existing spec is affected by both (Core part and Perf. part), then it has to be listed twice with appropriate approval dates.

# 6 Work item Rapporteur(s)

*Primary: Benoist Sébire, Nokia,* *benoist.sebire@nokia.com* *(RAN2)*

*Secondary: Huilin Xu, Qualcomm,* *huilinxu*@qti.qualcomm.com *(RAN1)*

NOTE: The first listed Rapporteur has the overall responsibility for this WI (incl all secondary tasks).

# 7 Work item leadership

Primary: RAN2

Secondary: RAN1, RAN3

# 8 Aspects that involve other WGs

SA2 is involved for determination of XR specific information made available in the network and the UE.

# 9 Supporting Individual Members

*{At least 4 supporting Individual Members are needed. There is an expectation that these companies will provide resources to progress the work. Note that having 4 supporting companies is a necessary but not sufficient condition: the usual TSG approval process by consensus is needed for the WID approval.}*

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| Supporting IM name |
| Nokia |
| Nokia Shanghai Bell |
| Qualcomm Incorporated |
| Vodafone |
| CATT |
| Deutsche Telekom |
| Orange |
| Verizon |
| Mediatek |
| Lenovo |
| Motorola Mobility |
| Apple |
| Verizon |
| OPPO |
| Spark |
| Futurewei |
| Meta |
| Samsung |
| ITRI |
| III |
| Panasonic |
| vivo |
| China Unicom |
| KT Corp. |
| LG Uplus |
| InterDigital |
| Spreadtrum |
| KDDI |
| NEC |
| Fujitsu |
| Sony |
| CHTTL |
| Telecom Italia |
| ZTE Corporation |
| Ericsson |
| Google |
| New H3C |
| Huawei |
| HiSilicon |
| BT |
| Intel |
| LG Electronics |
| Xiaomi |
| Telia Company |
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