3GPP TSG-RAN WG2 Meeting #121 [R2-2304202](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304202.zip)

Athens, Greece, February-March, 2022

**Agenda item: 9.2**

**Source: Vice Chairman (Nokia)**

**Title: Report on LTE legacy, XR, QoE and MUSIM**

**Document for: Approval**

# Organizational

Rel-17 CR

- From R2 121, Rel-17 CRs are treated as normal (as Rel-16 Rel-15 etc), meaning that submitted CRs are agreed/not agreed individually.

- Chair Observation: As for Rel-16 Rel-15 rapporteurs may still do Rel-17 “rapporteur CRs” for miscellaneous small corrections. The work on Rapporteur CRs in normal maintenance phase is usually organized by TS rapporteurs (for maintenance in breakout sessions may alternatively be by WI rapporteur or other appointed).

Rel-17 UE capabilities

- Also for UE capabilities, normal CRs handling is planned, i.e. CRs should be per-WI and no planned merge into mega CRs. However, if it makes sense from some perspective, multi-WI CRs are not precluded (dec case by case).

Tdoc limitations

Tdoc limitations doesn’t apply to Rapporteur Input, i.e.

- Assigned summary rapporteur input of the summary.

- Email / offline discussions outcomes by discussion rapporteur,

- WI rapporteurs input for WI planning etc,

- TS rapporteur input for TS maintenance

- Contact Company of a LSin that triggers RAN2 action may submit one tdoc to facilitate the LS reply. This only applies to one of the contact companies in case there are several (default the first).

Tdoc limitations doesn’t apply to Input created at the meeting, revisions, assigned documents etc.

Tdoc limitations doesn’t apply to shadow / mirror CRs (Cat A), or In-Principle Agreed CRs.

Tdoc limitations applies to all other submitted tdocs (e.g. discussion tdoc and CR tdoc are counted as two).

**List of offline email discussions:**

**NOTE: the email discussion deadlines are meant to allow at least all regions to have one day to comment (other than weekend) and also give rapporteurs time to update their proposals before the meeting)**

**Email discussion deadlines**

**NOTE: No AT-meeting email discussion reports will be handled in sessions happening during Mon-Wed.**

**Deadline 1 (discussions for 1st week Thu online)**

* **Comment deadline:** Wednesday W1, 0700 UTC (for collecting views)
* **Rapporteur proposed outcome:** Wednesday W1, 1600 UTC (proposed outcome)
* **Document deadline:** 1h before session (discussion report)

**Deadline 2 (discussions for 2nd week Monday/Tuesday online)**

* **Comment deadline:** Friday W1, 0900 UTC (for collecting views)
* **Rapporteur proposed outcome:** Monday W2, 1000 UTC (proposed outcome)
* **Document deadline:** 1h before session (discussion report)

**Deadline 3 (discussions for 2nd week Wednesday online)**

* **Comment deadline:** Tuesday W2, 0800 UTC (for collecting views)
* **Rapporteur proposed outcome:** Tuesday W2, 1500 UTC (proposed outcome)
* **Document deadline:** 1h before session (discussion report)

**Deadline 4 (LS/CR approval via email):**

* **Comment deadline:** WednesdayW2, 0800 UTC (for wording proposals)
* **Rapporteur proposed outcome:** EOM (approved LS or agreed CR)

**Organizational**

* [AT121bis-e][200] Organizational – LTE legacy, XR, QoE and MUSIM (RAN2 VC)

Scope:

* + - Share plans for the meetings and list of ongoing email discussions for the sessions
    - Share meetings notes and agreements for review and endorsement
    - Flag LSs and in-principle agreed CRs for discussion

      Intended outcome:

* + - General information sharing about the sessions

      Deadline for flagging LSs:

* + - Deadline: Deadline 2

**Post-meeting email discussions**

**AT-meeting offline discussions (started at meeting start)**

* [AT121bis-e][210][XR] Retransmission-less CG for XR (Huawei)

Scope: Discussion whether Rel-17 NTN solution for retransmission-less CG can work for XR (based on contributions to this meeting, e.g. [R2-2302584](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302584.zip)). Can also provide draftCR illustrating the changes.

Intended outcome: Discussion report in [R2-2304391](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304391.zip)

Deadline: Deadline 1

* [AT121bis-e][220][QoE] SRB5 configuration and usage (China Unicom)

Scope: Discuss how the SRB5 is configured by MN/SN, how does switching the reporting leg and QoE pause work. Attempt to provide proposal on agreeable details as well as details requiring further discussion.

Intended outcome: Discussion report in [R2-2304395](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304395.zip)

Deadline: Deadline 2

* [AT121bis-e][230][MUSIM] UE capability restrictions (vivo)

Scope: Discuss and attempt to converge on the set of UE capabilities allowed to be temporarily restricted for MUSIM.

Intended outcome: Discussion report in [R2-2304397](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304397.zip)

Deadline: Deadline 2

**AT-meeting offline discussions (started after 1st week Monday online)**

* [AT121bis-e][211][XR] Running Stage-2 CR (Nokia)

Scope: Collect comments for the Stage-2 CR based on [R2-2302718](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302718.zip) and SA2/SA4 agreements.

Intended outcome: Discussion report in [R2-2304392](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304392.zip) and (if possible) updated Stage-2 running CR in [R2-2304393](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304393.zip).

Deadline: Deadline 4

* [AT121bis-e][212][XR] BSR solutions (Qualcomm)

Scope: Attempt to find out which among the BSR table solutions have most support and preclude those with least support (if possible). Should discuss pros and cons of each solution and determine which are acceptable to companies (and why). Can also discuss other general details (e.g. how the BSR tables are used).

Intended outcome: Discussion report in [R2-2304394](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304394.zip).

Deadline: Deadline 2

**AT-meeting offline discussions (started after 1st week Tuesday online)**

* [AT121bis-e][231][MUSIM] RAN4 aspects of MUSIM (Samsung)

Scope: Discuss what to do in RAN2 for MUSIM gap priorities (based on RAN4 LS): Can UE indicate gap priority preference? Is the gap priority applicable to aperiodic gaps? What is the network behaviour (i.e. accept/reject/change priority)? Are there any RAN4 impacts on maximum UL power change?

Intended outcome: Discussion report in [R2-2304398](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304398.zip)

Deadline: Deadline 2

**AT-meeting offline discussions (started after 1st week Wednesday online)**

* [AT121bis-e][221][QoE] LS replies to QoE (Huawei)

Scope: Determine whether to send replies to LSs received from other groups (e.g. RAN3, SA4 and SA5) and attempt to provide RAN2 reply. If LS reply is agreeable, discussion should also determine what to reply and what the target groups are (for To and Cc).

Intended outcome: LS out to SA4/SA5 in [R2-2304396](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304396.zip) (if agreed).

Deadline: Deadline 4

**Dates and deadlines – Technical Meeting (see also RP-230050)**

March 31st Deadline for Long email discussions into R2 121.

April 3rd – 7th Inactive period, no email discussions.

April 7th 1000 UTC **Tdoc Submission Deadline**.

April 17th 0700 UTC **e-Meeting Start** (by email), Week 1  
Rapporteurs in non-favourable time zones may kick off AT meeting offline / email discussions before meeting start (at most 12h before). It is assumed that participants starts paying attention to offline / email discussions after e-meeting start.

April 21st 1000 UTC **Weekend break**, Suspend decision making in email discussions (= no deadlines etc). It should be possible for a delegate to take the weekend off, rejoin and not miss decisions.

April 24th 1000 UTC **Resume after weekend**. Resume decision making in email discussions, Week 2.

April 26th 1000 UTC **e-Meeting Stop**, no more technical comments for AT-meeting email discussions. Decision confirmations announced within 24h. Session notes for email checking.

April 28th 1000 UTC Deadline Short Email Discussions (limited possibility - for very short email discussions, if needed short email discussion can be started before e-meeting Stop). E.g. for LS outs, or other priority topics e.g. conclusion of R17 CRs.

May 1st – 5th Inactive period, no email discussions.

May 12th 1000 UTC Tdoc submission deadline RAN2 122 (next meeting).

Very limited possibility for long email discussions.

**Web Conference Schedule (Apr 17- 26)**

Note that this schedule is indicative and can change. After Week 1 the schedule for Week 2 will be updated.

**WEEK 1**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Time Zone UTC** | **Web Conference R2 - Main** | **Web Conference R2 - BO1** | **Web Conference R2 - BO2** | **Offline GTW Session**  **(limited use, only specific issues if needed, need approval by session chair)** |
| **Monday** |  |  |  |  |
| 12:30-13:30 | NR18 Mobility Enh [2] (Johan) | NR18 XR [2] (Tero)  - 7.5.1: Work plan ([R2-2302715](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302715.zip)), SA2/SA4 status ([R2-2302716](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302716.zip)/[R2-2302717](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302717.zip)), Stage-2 running CR ([R2-2302718](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302718.zip))  - 7.5.4.1: BSR tables for XR (e.g.[R2-2302515](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302515.zip), [R2-2303862](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303862.zip), [R2-2302851](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302851.zip))  ~~- 7.5.2: TSCAI vs. PIN DB reporting (e.g.~~ [~~R2-2303800~~](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303800.zip)~~,~~ [~~R2-2303986~~](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303986.zip)~~)~~ | NR18 SL Relay [1.5] (Nathan)  - 7.9.1 Organizational ([R2-2302442](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302442.zip), [R2-2302994](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302994.zip))  - 7.9.4 Multi-path ([R2-2303857](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303857.zip), [R2-2302924](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302924.zip), aspects of [R2-2303342](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303342.zip)) |  |
| 13:30-14:30 | NR18 Mobile IAB [0.5] (Johan) | NR18 UAV [1] (Diana)  7.8.1: LSs  7.8.2: Email discussion 313  7.8.3: Email discussion 314 | NR18 Pos [2] (Nathan)  - 7.2.1 Organizational ([R2-2302449](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302449.zip), [R2-2302738](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302738.zip) / [R2-2302739](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302739.zip))  - 7.2.2 Sidelink positioning ([R2-2302740](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302740.zip), [R2-2304033](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304033.zip), [R2-2304005](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304005.zip)) |  |
| 14:30-15:30 | NR18 AIML [1] (Johan) | NR18 NCR [0.5] (Sasha)  7.1.1 (LS from RAN1 and baseline CRs)  7.1.2 (agenda item summary)  7.1.3 ([R2-2303288](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303288.zip), [R2-2302788](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302788.zip), agenda item summary for issues not covered in 3288) | Maintenance Early items (Nathan Qianxi)  Rel-17 relay:  - 6.5.2 CP ([R2-2304189](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304189.zip))  - 6.5.3 UP ([R2-2304191](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304191.zip))  Rel-17 positioning:  - 6.7.2 RRC ([R2-2302638](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302638.zip), [R2-2302992](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302992.zip))  - 6.7.4 MAC ([R2-2302991](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302991.zip), [R2-2304049](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304049.zip))  - 6.7.5 UE cap ([R2-2302745](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302745.zip))  - 6.7.3 LPP ([R2-2304192](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304192.zip))  R16 SL  - 5.2: [R2-2303211](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303211.zip)/3212  R17 SL:  - 6.10.1: [R2-2302410](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302410.zip) (R1 LS reply on default CBR)  - 6.10.3: [R2-2303744](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303744.zip)/3745 |  |
| **Tuesday** |  |  |  |  |
| 12:30-13:30 | NR18 LP WUS [0.5] (Johan) | NR18 NTN enh [1] (Sergio)  - 7.7.1  - 7.7.4.1.1  - 7.7.4.1.2: report of [Post121][106] | NR18 SL evolution [1] (Qianxi)  7.15.1, 7.15.2, 7.15.3 |  |
| 13:30-14:30 | NR17  [6.1.3.2] Intraband ENDC  [6.1.3.3] IAB Beam Mgmt, Power Ctrl and Stage-2.  NR18 Other [2] (Johan)  - Multi-Carrier Enh,  - eNPN | NR18 NTN enh [1] (Sergio)  - 7.7.4.2  - 7.7.3  AI 7.25.3:  - [R2-2304184](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304184.zip) Work plan for SI on self-evaluation towards the IMT-2020 submission of the 3GPP Satellite Radio Interface Technology | NR18 SL evolution [1] (Qianxi)  7.15.3 (cont.), 7.15.4 |  |
| 14:30-15:30 | NR18 Mobility Enh [2] (Johan)  [7.4.2] L1L2 Triggered Mobility Continuation | Maintenance Early Items (Sergio, Tero)  LTE legacy (Tero)  - 4.1: [R2-2303818](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303818.zip) (+ [R2-2303821](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303821.zip), [R2-2303822](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303822.zip) - QoE configuration release)  - 7.17.4: [R2-2302430](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302430.zip) (RAN4 LS for MUSIM gap priority) | NR18 SL evolution [1] (Qianxi)  7.15.4 (cont.), 7.15.5, 7.15.6 |  |
| **Wednesday** |  |  |  |  |
| 12:30-13:30 | NR18 AIML [1] (Johan) | NR18 QoE [1] (Tero)  - 7.14.1: Work plan ([R2-2304084](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304084.zip)), LSs from RAN3/SA5 ([R2-2302425](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302425.zip), [R2-2302461](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302461.zip), [R2-2302463](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302463.zip)), running CRs ([R2-2303676](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303676.zip))  - 7.14.2: RRC configuration and area scope (e.g. [R2-2303363](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303363.zip), [R2-2303596](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303596.zip), [R2-2303642](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303642.zip)), ~~AS layer buffer size (e.g.~~ [~~R2-2303677~~](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303677.zip)~~,~~ [~~R2-2302886~~](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302886.zip)~~)~~ | NR18 SL Relay [1.5] (Nathan)  - 7.9.2 U2U (summary in [R2-23xxxxx](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-23xxxxx.zip))  - 7.9.3 Service continuity ([R2-2303110](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303110.zip) / [R2-2302923](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302923.zip), [R2-2303006](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303006.zip)) |  |
| 13:30-14:30 | NR18 Other [2] (Johan)  - Measurement Gap Enh 2  - Air To Ground, NOTE likely NTN-related. | NR18 Network Energy Saving [1] Early items (Diana)  7.3.2: DTX/DRX email discussions 312, 311 | NR18 SL Relay [1.5] (Nathan)  - 7.9.3 Service continuity (continued from above)  - 7.24.2 TEI18 ([R2-2303746](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303746.zip))  - 7.9.5 DRX (if time: [R2-2303488](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303488.zip)) |  |
| NR18 MBS UP [0.75] (Dawid)  - Summary of [Post121][607][eMBS] |
| 14:30-15:30 | NR18 MBS UP/CP [0.75] (Dawid)  - Summary of [Post121][607][eMBS], cont.  - Summary of [Post121][606][eMBS] | NR18 URLLC [0.5] (Diana) | NR18 Pos [2] (Nathan)  - 7.2.3 RAT-dependent integrity (summary in [R2-23xxxxx](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-23xxxxx.zip))  - 7.2.4 LPHAP (start if time: summary in [R2-23xxxxx](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-23xxxxx.zip)) |  |
| **Thursday** |  |  |  |  |
| 03:30-04:30 | NR1516  - Need Code secondary DRX,  - refservCellIndicator  NR18 Other [2],  - NCD SSB for non-RedCap UE  NR18 TEI [1] (Johan) | NR18 XR [2] (Tero)  - 7.5.3: DRX for XR (e.g. [R2-2303861](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303861.zip), [R2-2302514](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302514.zip), [R2-2303755](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303755.zip)) , SFN wrap-around (e.g. [R2-2302583](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302583.zip), [R2-2303302](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303302.zip))  - 7.5.4.3: Report of [210] ([R2-2304391](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304391.zip)) | LTE18 IoT NTN [1] (Sergio)  - 7.6.1  - 7.6.2.1 Report of [103]  - 7.6.2.2 Report of [104] |  |
| 04:30-05:30 | NR18 Mobility Enh [2] (Johan) | NR18 XR [2] (Tero)  - 7.5.2: TSCAI vs. PIN DB reporting (e.g. [R2-2303800](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303800.zip), [R2-2303986](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303986.zip))  - 7.5.2: UL assistance information for XR (e.g. [R2-2302909](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302909.zip), [R2-2302756](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302756.zip), [R2-2302513](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302513.zip), [R2-2302719](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302719.zip))  ~~- 7.5.4.2: Discard operation in XR (e.g.~~ [~~R2-2303303~~](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303303.zip)~~,~~ [~~R2-2303722~~](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303722.zip)~~)~~ | LTE18 IoT NTN [1] (Sergio)  - 7.6.3.1 Report of [Post121][105]  - 7.6.3.2  - 7.6.4 |  |
| **Friday** |  |  |  |  |
| 03:30-04:30 | NR18 MIMO evo [0.5] (Erlin)  7.20.1 Organizational  7.20.2 (per TRP UE-initiated RACH procedure, other R2 impacts with 2TAs, potential LS to R1, etc.)  7.20.3 (only if time allows) | eRedcap [1] (Mattias)  7.19.1 Organizational  7.19.2 Enhanced eDRX in RRC\_INACTIVE  Incl. AT-meeting email disc summary  7.19.3 Further reduced UE complexity in FR1  Incl. AT-meeting email disc summary | NR18 SONMDT [0.5] (HuNan) |  |
| 04:30-05:30 | NR18 fCovEnh [0.5] (Johan) | NR18 Pos [2] (Nathan)  - 7.2.4 LPHAP (summary in [R2-23xxxxx](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-23xxxxx.zip))  - 7.2.5 RAN1 topics ([R2-2302818](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302818.zip))  - 7.24.1 TEI18 (if time: [R2-2302413](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302413.zip) / [R2-2303498](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303498.zip) / [R2-2303499](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303499.zip) / [R2-2303500](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303500.zip)) |  |

**WEEK 2**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Time Zone UTC** | **Web Conference R2 - Main** | **Web Conference R2 - BO1** | **Web Conference R2 - BO2** | **Offline GTW Session**  **(limited use, only specific issues if needed, need approval by session chair)** |
| **Monday** |  |  |  |  |
| 12:30-13:30 | NR18 Mobility Enh [2] (Johan)  -- RRC tdocs (e.g. ref config / cand config)  -- MAC partial reset.  -- Cell Switch MAC CE | NR18 XR [2] (Tero)  - Report of [212]: XR BSR solutions ([R2-2304394](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304394.zip))  ~~- 7.5.4.2: Discard operation in XR (e.g.~~ [~~R2-2303303~~](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303303.zip)~~,~~ [~~R2-2303722~~](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303722.zip)~~)~~ | NR18 Pos [2] (Nathan)  - Email discussion checkpoint: [412], [413], [414], [417], [423], [424] (quick checks and easy conclusions)  - 7.24.1 TEI18 (if not done Friday week 1)  - 7.24.2 TEI18 (new proposals: [R2-2303123](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303123.zip), [R2-2304007](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304007.zip)) |  |
| 13:30-14:30 | NR18 CBs (Johan)  - AIML  - mIAB | NR18 MUSIM [0.5] (Tero)  - 7.17.1: Running CRs ([R2-2303266](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303266.zip))  - 7.17.2: Reactive/proactive mechanisms (e.g. [R2-2302781](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302781.zip), [R2-2303639](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303639.zip)), UE-initiated Scell/SCG (de)activation (e.g. [R2-2303455](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303455.zip), [R2-2303779](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303779.zip)) | NR18 UAV [1] (Diana)  - 7.8.5. – BRID (AT meeting email 304)  - 7.8.4 – subscription based aerial UE ID (if time permits) |  |
| 14:30-15:30 | NR18 Other [2] (Johan)  - eNPN Initial discussion  NR18 AIML CBs (Johan)  -- [014] Model ID | NR18 MUSIM CB (Tero): 14:30-15:00  - 7.17.3: Report of [231]: RAN4 aspects of MUSIM ([R2-2304398](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304398.zip))  ~~IF time allows:~~  ~~- 7.17.3: Report of [230]: UE capability restrictions (~~[~~R2-2304397~~](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304397.zip)~~)~~  R17 NR/IoT NTN (Sergio) (15:00-15:30)  R17 NR NTN:  - 6.6.2: Report of [102] (if needed)  - 6.6.1: Report of [111] (if needed)  - 6.6.3: Report of [112],[113](if needed)  R17 IoT NTN:  - 4.2.3: Report of [101] (if needed)  - 4.2.1/4.2.2-: Report of [111] (if needed) | NR18 UAV [1] (Diana)  - continuation of flight path reporting proposals  - 7.8.5. – BRID (AT meeting email 304) |  |
| **Tuesday** |  |  |  |  |
| 12:30-13:30 | R18 Other CB (Johan)  -- [020][MCE] LS out UL TX Switching  -- [021][MCE] UL TX Switching | NR18 QoE [1] (Tero)  - 7.14.2: Report of [220]: SRB5 details ([R2-2304395](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304395.zip))  - 7.14.2: RVQoE in NR-DC (e.g. [R2-2303511](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303511.zip))  IF time allows:  - 7.14.2: Area scope handling (e.g. P12 from [R2-2303596](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303596.zip) and P7-8 from [R2-2303642](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303642.zip))), AS layer buffer size (e.g. [R2-2303677](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303677.zip), [R2-2302886](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302886.zip)) | NR18 Network Energy Saving [1] (Diana)  - continuation of email discussion 311  - 7.3.5 Mobility (AT meeting email 303) |  |
| 13:30-14:30 | NR18 CBs (Sasha)  Reports from 703, 704, 705  Reports from 706 and 707 if needed | NR18 NTN enh CBs (Sergio)  - 7.7.4.1.1: Report of [106],[107]  - 7.7.4.1.2: Report of [108],[109],[110]  - 7.7.2: Report of [105]  - 7.7.3  (some topics might be moved to the Wednesday CB session) | NR18 NES continuation (Diana) (30-40mins)  NR18 UAV (if needed based on progress of AT meeting email discussion on measurement reporting) |  |
| 14:30-15:30 | NR18 MIMO evo (Erlin)  -- LS to RAN1  -- 7.20.3, initial discussions if time allows | NR17/18 CBs (Dawid)  - Reports of [601], [602], [603], [604], as needed  - 7.11.3, if time allows | CBs (Qianxi)  - Reports of [502], [503], [505], [507], [509]  - 7.15.4, 7.15.6, if time allows. |  |
| **Wednesday** |  |  |  |  |
| 03:30-04:30 | NR18 Mob Enh CB (Johan)  -- [016] Reply LS on L1 measurement RS configuration and PDCCH ordered RACH for LTM  -- [018] Procedure Consolidation  -- [019] L1 Measurements | CBs (Tero) – 03:30-04:00  NR18 XR (Tero) – 15 minutes  - 7.5.4.2: Discard operation in XR (e.g. [R2-2303303](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303303.zip), [R2-2303722](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303722.zip))  - 7.5.1: New LS from SA4 on the N6 PDU Set Identification ([R2-2304493](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304493.zip))  NR18 QoE [1] (Tero) – 5 minutes  - 7.14.1: Report of [221]: LSs on QoE ([R2-2304396](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304396.zip), [R2-2304399](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304399.zip))  NR18 MUSIM CB (Tero) – 10 minutes  - 7.17.3: Report of [230]: UE capability restrictions ([R2-2304397](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304397.zip)) | NR18 CBs (Nathan)  Positioning CBs: [422], [428], [429]  Start relay CBs: [415], [416], [418], [419], [425], [430], [431], [432] |  |
| 04:30-05:30 | NR18 CB AIML  -- [024][AIML] Data Collection Table | TBD early start:  LTE18 IoT NTN CBs CB (Sergio)  - 7.6.2.1: Report of [103]  - 7.6.2.2: Report of [104]  - 7.6.3.1: Report of [114]  - 7.6.4: Report of [115]  NR18 NTN enh CBs (Sergio)  - remaining topics from Tuesday CB session | CB (Nathan)  Remainder of relay CBs |  |

**Offline Web Conference Schedule**

Number Title Day/Time Place Coordinator

# 4 EUTRA Rel-17 and earlier

Only essential corrections. No documents should be submitted to 4. Please submit to 4.x

## 4.1 EUTRA corrections Rel-17 and earlier

(NB\_IOTenh4\_LTE\_eMTC6-Core; leading WG: RAN1; REL-17; WID: RP-211340)

(UPIP\_EN-DC\_UE; leading WG: RAN3; REL-17; WID: RP‑213669)

(LTE TEI17)

Essential corrections to LTE Rel-17 topics not covered by other agenda items.

(NB\_IOTenh3-Core; leading WG: RAN1; REL-16; started: Jun 18; Completed: June 20; WID: RP-200293); REL-15 and Earlier NB-IoT WIs are in scope but not listed explicitly (long list).

(LTE\_eMTC5-Core; LTE\_eMTC5-Core; leading WG: RAN1; REL-16; started: Jun 18; Completed: June 20; WID: RP192875;), REL-15 and Earlier eMTC WIs are in scope but not listed explicitly (long list).

(LTE\_feMob-Core; leading WG: RAN2; REL-16; started: Jun 18; Completed: June 20; WID: RP-190921);

(LTE\_terr\_bcast-Core, LTE\_DL\_MIMO\_EE-Core, LTE\_high\_speed\_enh2-Core; LTE TEI16 Non-positioning);

REL-15 and Earlier EUTRA WIs are in scope but not listed explicitly (long list), Except V2X and Sidelink WIs and Positioning WIs, which are adressed by AIs below.

NOTE that LTE corrections related to NR WIs or Joint NR LTE WIs should be submitted to NR AIs below.

NOTE that LTE corrections which are the same as an NR correction should be submitted to the respective NR AI (so the NR CR and LTE CR can be treated together).

This Agenda Item is treated in the EUTRA Breakout session

**Online (1st week Tuesday) – QoE configuration release (3)**

Release of QoE configuration/reporting at upper layers when UE moves to IDLE/INACTIVE:

[R2-2303818](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303818.zip) Correction on QoE configuration release Google CR Rel-15 36.331 15.20.0 4925 - F LTE\_QMC\_Streaming-Core

*After entering RRC\_IDLE or RRC\_INCATIVE, the UE should inform upper layers the application layer measurement configuration release and discard the received application layer measurement reports.*

1> inform upper layers to clear the stored application layer measurement configuration;

1> discard received application layer measurement report information from upper layers;

1> consider itself not to be configured to send application layer measurement report;

- Lenovo wonders about the scenario: it’s assumed that UE receives connection release but is still configured with QoE measurements? Thinks network would always release the configuration before releasing the UE. Google indicates this was just to align with NR. Lenovo thinks we have no setup/release in NR.

- QC thinks that network may not always want retrieve the report. Could add “if any” in first two statements to be precise.

- Samsung wonders that since we only support INACTIVE with 5GC, do we need CRs from Rel-15? Thinks the last sentence is not needed. QC thinks we may not need Rel-15 CRs, could use magic sentence.

- Ericsson thinks it would be good to add this since also the application layer is involved.

- Huawei thought this is not needed. Only informing the application layer is truly missing, and since this is from Rel-15 UE implementations would anyway handle this properly. Could also keep the configuration for INACTIVE.

- CATT agrees with the change for IDLE but not for INACTIVE. Can align with NR Rel-17 for INACTIVE.

* Some support to go with Rel-17 CR (with magic sentence) for IDLE. Companies can bring inputs to next meeting addressing the concerns raised.

[R2-2303821](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303821.zip) Correction on QoE configuration release Google Inc. CR Rel-16 36.331 16.12.0 4926 - A LTE\_QMC\_Streaming-Core

[R2-2303822](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303822.zip) Correction on QoE configuration release Google CR Rel-17 36.331 17.4.0 4927 - A LTE\_QMC\_Streaming-Core

# 7 Rel-18

## 7.5 XR Enhancements for NR

(NR\_XR\_enh-Core; leading WG: RAN2; REL-18; WID: [RP-230786](https://www.3gpp.org/ftp/TSG_RAN/TSG_RAN/TSGR_99/Docs/RP-230786.zip))

Time budget: 2 TU

Tdoc Limitation: 5 Tdocs

### 7.5.1 Organizational

Including LSs and any rapporteur inputs (e.g. work plan, SA2/SA4 progress reports)

**Online (1st week Monday) – work plan (1)**

[R2-2302715](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302715.zip) Work Plan for Rel-18 WI on XR Enhancements for NR Nokia, Qualcomm (Rapporteurs) Work Plan Rel-18 NR\_XR\_enh-Core

* Endorsed

**Online (1st week Monday) – SA2/SA4 status (2)**

[R2-2302716](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302716.zip) SA2 Status for XR Nokia, Qualcomm (Rapporteurs) discussion Rel-18 NR\_XR\_enh-Core

- Ericsson thinks PDUs in QoS flow doesn’t matter to RAN2 because we only handle DRBs. Nokia clarifies this might impact the EOBI. Ericsson thinks that’s more configuration issue.

- LGE think there may be some impacts to PDCP from the QoS flow.

- Futurewei thinks NOTE in data burst is quite generic and note sure the it is applicable to all.

* Noted (SA2 agreements can be discussed as part of the running Stage-2 CR discussion)

[R2-2302717](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302717.zip) SA4 Status for XR Nokia, Qualcomm (Rapporteurs) discussion Rel-18 NR\_XR\_enh-Core

* Noted (SA4 agreements can be discussed as part of the running Stage-2 CR discussion)

**Online (1st week Monday) – Stage-2 CR (1)**

[R2-2302718](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302718.zip) Stage 2 Overview of XR Enhancements Nokia, Qualcomm (Rapporteurs) draftCR Rel-18 38.300 17.4.0 B NR\_XR\_enh-Core

- Nokia clarifies there will be temporary annex for agreements. Can also consider some XR definitions from the TR.

- Ericsson thinks Stage-2 doesn’t normally capture service parameters, which XR awareness now does. Could have a reference to SA2 instead.

- OPPO would like to clarify the EOBI is only for DL, not for UL.

- Vodafone wonders if we are talking about only GBR traffic since TSCAI is restricted to those at the moment? May need to consider whether this is really the case for all XR traffics. Nokia agrees this could be discussed.

- Huawei thinks we could capture some SI agreements in the Stage-2, e.g. PDU set discard etc.

- Futurewei would like to discuss the data burst definition.

* RAN2 can discuss if XR traffic is only about GBR or can also be non-GBR (this may require RAN3 views)
* AT-meeting discussion [211] to collect comments to the Stage-2 CR (Nokia). Companies are encouraged to provide comments on the CR to rapporteur(s).
* Rapporteur to provide updated version to RAN2#122 for endorsement.

**AT-meeting offline discussions (started after 1st week Monday online)**

* [AT121bis-e][211][XR] Running Stage-2 CR (Nokia)

Scope: Collect comments for the Stage-2 CR based on [R2-2302718](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302718.zip) and SA2/SA4 agreements.

Intended outcome: Discussion report in [R2-2304392](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304392.zip) and (if possible) updated Stage-2 running CR in [R2-2304393](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304393.zip).

Deadline: Deadline 4

**By Email [211] – Report of [211] (1)**

[R2-2304392](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304392.zip) [DRAFT] LS on TSCAI for XR Nokia LS out Rel-18 NR\_XR\_enh-Core To:SA2 Cc:RAN3

* [211] The LS is agreeable
* [211] Remove [DRAFT] from title and use RAN2 as source
* [211] Revised in [R2-2304400](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304400.zip) with the above changes

[R2-2304400](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304400.zip) LS on TSCAI for XR RAN2 LS out Rel-18 NR\_XR\_enh-Core To:SA2 Cc:RAN3

* [211] Approved

[R2-2304393](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304393.zip) Stage 2 Overview of XR Enhancements Nokia, Qualcomm (Rapporteurs) draftCR Rel-18 38.300 17.4.0 B NR\_XR\_enh-Core

* [211] The definitions of PSDB, PSER, PSIHI, PSI, EoDB etc. are defined in TS23.501 and RAN2 does not intend to change them. The definitions in Stage-2 are intended to allow self-contained description of XR functionality to be captured. Add disclaimer to the SA2 definitions that they are defined in TS23.501, i.e. “as defined in TS23.501 [3], ...”.
* [211] Endorsed as running CR, to be updated based on the latest agreements in this meeting for RAN2#122

**Online (2nd week Wednesday) – discussion on contentious points of the Stage-2 running CR for XR**

- Nokia explains there was some contention on the CR.

- MTK has two concerns: The definition of PDU set (not needed, already in SA2 specification) and text copied from TR (doesn’t want to endorse aspects “study further”)

* Stage-2 text indicating “further investigation” or “FFS” can be still sorted out in the next update. Especially aspects that have not been decided can be revised without prejudice.

**Online (2nd week Wednesday) – New LS from SA4 (1)**

[R2-2304493](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304493.zip) LS out on the N6 PDU Set Identification (S4-230739; contact: Intel) SA4 LS in Rel-18 5G\_RTP, XRM, NR\_XR\_enh To:SA2, RAN2 Cc:RAN1

*SA4 thanks SA2 for confirming the progress of the normative work timeline. As indicated in S4-230419, the new RTP header extension under SA4 5G\_RTP will signal the PDU set information, including PDU set sequence number, PDU set boundary indication, PDU sequence number within a PDU set, PDU set size, and PDU set importance.*

*During SA4#123-e, it was agreed to add a 3-bit End of Data Burst indication in the new header extension. SA4 has committed to progressing the semantics of the fields and developing normative guidelines for the Application Server on how to populate the fields of the RTP header extension for the supported media codecs. Upon completing such an effort, SA4 will continue to provide guidelines on how the UPF may extract some of the supported PDU set information from existing RTP/SRTP headers, header extensions, and payloads in case the newly defined RTP header extension is absent.*

*In addition to marking the last PDU of the data burst, SA4 sees the benefit of using additional bits to indicate inter-burst time, which may change dynamically due to various reasons, including application-layer rate control. SA4 believes that this can enable the RAN to switch to the most appropriate power state. SA4 kindly requests feedback from SA2 and RAN2 on the value and feasibility of such solution and if that can be supported within Rel. 18 timeframe.*

*SA4 is also defining the SDP signaling of the usage of the RTP header extension based on RFC8285. This allows the AF to receive certain PDU set information and pass it along to the PCF/NEF using the N5/N33 interface procedures. The header extension configuration should be shared with the UPF, and SA4 will provide the relevant configuration information to SA2/CT3 for this purpose.*

*1. SA4 would like to kindly ask RAN2 to provide feedback on the feasibility and value of having additional signaling bits related to End of Burst and inter-burst time within Rel-18.*

* Noted (RAN2 actions including reply LS can be discussed in RAN2#122)

### 7.5.2 XR awareness

Including discussion on XR traffic assistance information from UE to network (e.g. to support the tethering use case), e.g. periodicity, UL traffic arrival information

Including discussion on the use of PDU set information in RAN for DL and UL (e.g. PSI, PSIHI, PSER, PSDB, EDBI) and what (if anything) needs to be specified in RAN2.

**Online (1st week Thursday) – TSCAI vs. PIN DB reporting (2)**

Is TSCAI sufficient, or can e.g. PIN delay budget reporting be used for the UL jitter information in e.g. tethering use case?

[R2-2303800](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303800.zip) Considerations on PDU sets and Traffic assistance information for XR CMCC discussion Rel-18 NR\_XR\_enh-Core

*Observation 1. In case XR device is tethered to associated UE, jitter information of UL PDUs is useful to RAN, e.g. for configuring CG.*

*Proposal 1: PDU Set integrated QoS handling should be taken into considered, e.g. PSDB, PSER, when PSIHI is set, PDB otherwise.*

*Proposal 2: To support the usage of PSI in case of congestion, the PDU set with different PSI even with same QoS value will be set with different timers, and PSDB is the primary parameter for discard.*

*Proposal 3: TSCAI (Time Sensitive Communication Assistance Information) can be reused to provide the Application profile of traffic flow without PDU set, e.g. traffic periodicity and PDU size, to the RAN via NGAP-CP signaling.*

*Proposal 4: The UE is preferred to send UL assistance information to gNB for UL XR traffic.*

*Proposal 5: it is proposed to enable UE to report the PDU set information, e.g., buffer delay, buffer size, importance for the UL PDU set data buffered in the PDCP/RLC.*

* Focus on P3-5

- OPPO wonders if P3 is only for XR service without PDU set, and P4 is for XR with PDU set? For P5, wonders how this is used? CMCC clarifies P3 is for pose without PDU set. P4/5 is mainly for tethering case. OPPO wonders if we should inform SA2 about P3 since TSCAI is so far only for PDU sets. CMCC thinks SA2 has mainly discussed DL.

- Nokia wonders if using tethering means we can’t use TSCAI? CMCC thinks we can extend TSCAI with jitter information in that case. CATT thinks app periodicity should not change with tethering, only jitter.

- LGE wonders why PSI needs to be reported? CMCC thinks scheduling could use it depending on NW implementation. LGE thinks UE just transmits the data in order so not sure how network can use it.

- Intel thinks P3 seems confusing to us. SA2 has already defined TSCAI with information associated to both DL and UL QoS flow (as shown in SA2 TS table included Intel TDoc). In our understanding, RAN2 only needs to focus on UL jitter (as SA2 definition is only for DL

- vivo assume some of UL traffic characteristic comes from high layer, does P4 means all UL traffic information should be provided from UE?

* Noted

[R2-2303986](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303986.zip) Discussion on UL jitter handling Samsung discussion Rel-18 NR\_XR\_enh-Core

*Observation 1. RAN2 assume that jitter for UL XR traffic may present for tethering use cases.*

*Observation 2. XR device’s tethering use case matches the architecture of Personal IoT Network (PIN) using non-3GPP access (e.g., WiFi, BT).*

*Observation 3. The non-3GPP delay can present UL jitter for XR where the delay occurs between PINE corresponding to a XR device and PEGC corresponding to a smartphone.*

*Observation 4. The non-3GPP delay budget may be requested between UE and 5GC using the UE requested PDU Session Establishment/modification procedure.*

*Proposal 1. RAN2 is kindly asked to discuss that the non-3GPP delay budget defined for Personal IoT Network (PIN) can be utilized for UL jitter for XR.*

*Proposal 2. RAN2 is kindly asked to discuss that the signalling procedure for UL jitter follows the non-3GPP delay budget request procedure between UE and 5GC for Personal IoT Network (PIN).*

* Focus on P1-2

- CMCC wonders if this is proposed as a special use case or for everything in XR? Thinks SA2 considers this as independent study and this has not been discussed in the context of XR. Samsung thinks tethering case is the same regardless of the WI.

- Xiaomi thinks SA2 has not identified jitter for this. Would need to wait for SA2 so not sure we can use this.

- Intel thinks SA2 has already agreed on new DL jitter definition for XR (referred as "N6 Jitter Information "). Therefore it is not clear why RAN2 should choose a different approach for UL jitter. Samsung thinks current TSCAI only considers DL jitter and anyway it’s up to SA2 to define even UL jitter.

- Huawei thinks here jitter is provided from UE to 5GC, so would need 5GC to RAN signalling in addition. So could have RAN3 impacts. Samsung agrees.

- CATT thinks PINE solution doesn’t work for non-tethering case when we have encoder delay..

- MTK wonders if we need to ask anything from SA2? We could just define the signalling ourselves? ZTE, Apple, CATT agrees.

- Huawei thinks SA2 doesn’t consider PINE for XR.

* Noted

**Online (1st week Thursday) – UL assistance information for XR (3)**

[R2-2302909](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302909.zip) XR awareness enhancements in RAN Intel Corporation discussion Rel-18 NR\_XR\_enh-Core

*Observation 1. During Rel-18 XR SI phase, RAN2 informed SA2 and SA4 multiple times the assumption that PDU set concept is applicable to UL side and UE is able to identify the corresponding PDU set related information. By not responding to this, RAN2 understands that there is no concern/issue identified by SA2 and SA4 on this regard.*

*Observation 2. Legacy release preference information could be used by UE when it knows that the data burst is ending; UE could inform the network its preferred RRC state (i.e., idle, inactive, connected, outOfConnected).*

*The proposals captured are the following:*

*Proposal 1. RAN2 does not need to discuss how UE AS layer is aware of the PDU set related information for UL XR traffic understanding that this decision should be up to SA2/SA4. As previously agreed by RAN2, AS layer only need to assume that the same PDU set concept/information currently defined by SA2 for DL traffic is also visible. No need to inform SA2/SA4 again.*

*Proposal 2. There is no RAN2 impact foreseen from SA2, SA4, CT1 and RAN3 specifications efforts to enable the signaling and mechanism to convey PDU set related information from CN to RAN. How is information is used by RAN, it is left up to network implementation. If this changes after upper layer’s specification of PDU set concept progresses, RAN2 can revisit this agreement.*

*Proposal 3. Define a new assistance information for UE to be able to report jitter information associated to UL XR traffic periodicity. How UE derives this jitter is left up to implementation (similarly as it is captured by SA2 for the jitter associated with the periodicity in DL.*

*Proposal 4. No need to define a new mechanism for UE to inform about the end of burst associated with UL XR traffic.*

* Focus on P2-4

- Nokia wonders if in P4, we have no data, we cannot identify the EoDB. Intel thinks the preferred RRC state is there.

- QC thinks EoDB is useful for UE power saving. Thinks RRC state indicator is not reliable, especially for UL jitter cases. Cannot use zero BSR always. Meta agrees. vivo also thinks EoDB can be used for power saving.

- MTK wonders if we really need EoDB and thinks padding BSR can be used. If there is more data, UE will transmit that.

- LGE thinks in the SA2 LS last meeting, it is said that "During a Data Burst, and until its end, the RAN should not assume periods of data transmission inactivity.". Thus, BSR=0 can indicate EoDB. No explicit EoDB signaling is needed.

- vivo thinks P2 could have RAN2 impact if we discuss how to use it.

- Ericsson agrees with MTK on EoDB. Huawei also thinks if there is a long jitter, it’s really unpredictable for power saving anyway. Padding BSR is enough for EoDB. Can consider BSR triggering further but not EoDB in UL.

- QC wonders if P3 means the information itself, or the message?

- MTK thinks UL jitter may not be useful. UE can calculate the jitter and report when is the last time NW is guaranteed to get data for CG. Nokia explains jitter can also be used for PDCCH skipping.

- Ericsson, Nokia, Huawei, ZTE, CATT, Apple, vivo support P3.

* 3. UE can report jitter information associated to UL XR traffic. How UE derives this jitter is left up to implementation (similarly as it is captured by SA2 for the jitter associated with the periodicity in DL. FFS what exactly is reported to the RAN (aim to have similar information as for DL). FFS on UL traffic data arrival reporting.
* FFS on whether EoDB signalling is needed.

[R2-2302756](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302756.zip) Enhancements for XR awareness CATT discussion Rel-18 NR\_XR\_enh-Core

*Observation 1: SA2 already concluded that the XR burst periodicity of a QoS flow is provided at QoS flow level in TSCAI/TSCAC for both DL and UL QoS flows.*

*Observation 2: UL jitter on encoded frames can be in the range 5ms at the encoder output, i.e. independently of tethering usecase.*

*Observation 3: Considering the UL Jitter range (5ms) such information is useful for the gNB to configure DRX and enhanced CGs.*

*Observation 4: In DL, gNB has all information to measure/monitor the actual PSER and set/adapt the DL BLER to meet the target PSER. No specification impact is foreseen.*

*Observation 5: RAN2 cannot assume that CN would use the “111” mapping alternative when in-order delivery is not required.*

*Observation 6: PSIHI can be set so that RAN only delivers complete PDU Sets over Uu, but it does not mean late (but complete) PDU Sets should not be delivered.*

*Observation 7: PSIHI does not control if a PDU Set can be discarded if it exceeds its PSDB.*

*Observation 8: PSDB can be useful to RAN for other purpose but the discarding operation (e.g. scheduler and/or remaining time reporting) and so cannot be considered as the only parameter controlling the discard operation.*

*Proposal 1: For each configured periodicity of UL XR video bursts, the UL jitter on packets arrival times is measured by the UE (by implementation) and reported to gNB as UAI.*

*Proposal 2: As a baseline, RAN2 reuses the same Jitter Information characterization as SA2, whenever concluded.*

*Proposal 3: UE should maintain the UL PSER measurement and feedback this information to gNB.*

*Proposal 4: RAN2 discusses UE autonomously triggering PDCP duplication upon reporting PSER above a threshold.*

*Proposal 5: RAN2 expresses the need to SA2/SA4 for a new parameter indicating when in-order delivery is not required for a QoS flow.*

*Proposal 6: RAN2 expresses the need to SA2/SA4 for a new parameter, e.g. discardOutdatedPDU-Set, to control whether to discard or not PDU Sets exceeding the PSDB outside congestion.*

*Proposal 7: Similar to the 5QI PDB, SA2 should provide a mean for RAN to convert the PSDB into the equivalent delay budget over the air-interface (AN PSDB).*

* Focus on P1-3, 7

[R2-2302513](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302513.zip) Discussion on XR awareness Qualcomm Incorporated discussion Rel-18 NR\_XR\_enh-Core

*Observation 1. End of burst indication by UE can help network determine whether to terminate DRX active time early and thus saves UE more power.*

*Proposal 1. Introduce uplink end of burst indication by UE.*

*Proposal 2. UE can include UL traffic periodicity of a logical channel in its assistance information to RAN. This information is a complement, not a replacement, to the traffic periodicity provided by CN to RAN.*

*Proposal 3. UE can include its preferred start offset for a CG in its assistance information to RAN.*

*Proposal 4. UE can include average and/or range of jitter in UL traffic associated with a logical channel in its assistance information to RAN.*

*Proposal 5. The assistance information in Proposal 2~4 can be signaled via the RRC message UE Assistance Information.*

* Focus on P1-4

[R2-2302719](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302719.zip) PDU Set and Data Burst Information Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_XR\_enh-Core

*Observation 1: In TR 26.926, statistical properties of P-traces are measured before the XR Server sends them on the network connection. Therefore, statistical properties of V/S/P-traces including size and jitter are independent on the device that hosts the XR server and direction of the data connection.*

*Observation 2: the tethering use case includes a volatile wireless link on the UL path of the XR application, which can contribute to both fixed delay but also additional jitter for on the Uu interface.*

*Observation 3: both delay and jitter information can be useful to RAN for RRM and scheduling decisions.*

*Observation 4: in the tethering use case the added tethering link delay/jitter can further constrain scheduling.*

*Observation 5: The most appropriate information between EOB indicator, End PDU of the PDU Set, PDU Set size, and other PDU Set information depends on the RAN functionality and its implementation.*

*And proposed the following:*

*Proposal 1: UL jitter should be informed to the gNB.*

*Proposal 2: PDU Set information like EOB indicator, End PDU of the PDU Set, PDU Set size is all useful and its use should be left to implementation.*

*Proposal 3: Consider PSER when PSIHI is set, PER otherwise. In other words, the PER criteria should ignore the lost PDUs due to discard triggered by PSIHI.*

*Proposal 4: Consider PSDB when PSIHI is set, PDB otherwise.*

* Focus on P3-4

[R2-2303358](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303358.zip) Views on Enhancements for XR-Awareness Apple discussion Rel-18 NR\_XR\_enh-Core

[R2-2303301](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303301.zip) RAN awareness of XR characteristics MediaTek Inc. discussion Rel-18 NR\_XR\_enh

[R2-2302850](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302850.zip) XR Awareness ZTE Corporation, Sanechips discussion

[R2-2302895](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302895.zip) XR awareness InterDigital discussion Rel-18 NR\_XR\_enh-Core

[R2-2302938](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302938.zip) Discussion on XR awareness Futurewei discussion Rel-18 NR\_XR\_enh-Core

[R2-2302950](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302950.zip) Considerations on XR awareness NEC discussion Rel-18 NR\_XR\_enh-Core

[R2-2302996](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302996.zip) Considerations on delay reporting and UL traffic arrival information KDDI Corporation discussion

[R2-2303081](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303081.zip) Considerations on XR PDU prioritization Sony discussion Rel-18 NR\_XR\_enh-Core

[R2-2303082](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303082.zip) Some considerations on PDU set information and UL traffic arrival information Sony discussion Rel-18 NR\_XR\_enh-Core

[R2-2303124](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303124.zip) Discussion on XR awareness TCL Communication discussion Rel-18

[R2-2303226](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303226.zip) Discussion on PDU sets awareness in RAN Lenovo discussion Rel-18

[R2-2303312](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303312.zip) Discussion on XR awareness OPPO discussion Rel-18 NR\_XR\_enh-Core

[R2-2303578](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303578.zip) Discussion on XR awareness Spreadtrum Communications discussion Rel-18

[R2-2303719](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303719.zip) Discussion on XR awareness Ericsson discussion Rel-18 NR\_XR\_enh

[R2-2303741](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303741.zip) On XR awareness Google Inc. discussion

[R2-2303786](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303786.zip) Discussion on XR-awareness NTT DOCOMO, INC. discussion

[R2-2303930](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303930.zip) Discussion on PDU Set Information on UL for UE ASUSTeK discussion Rel-18 NR\_XR\_enh-Core

[R2-2303998](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303998.zip) Discussion on PDCP duplication based on PDU set importance LG Electronics Inc. discussion NR\_XR\_enh-Core

[R2-2302711](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302711.zip) Discussion on XR awareness Xiaomi Communications discussion

[R2-2302810](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302810.zip) Discussion on XR awareness vivo discussion Rel-18 NR\_XR\_enh-Core

[R2-2303595](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303595.zip) Discussion on UL assistance information for XR traffic Huawei, HiSilicon discussion Rel-18 NR\_XR\_enh-Core

### 7.5.3 XR-specific power saving

Including discussion on solutions for DRX cycles with XR and the potential impacts to RAN1/4 specification (if any).

Including discussion on solutions for SFN wrap-around with XR and the potential impacts to RAN1/4 specification (if any).

**Online (1st week Thursday) – DRX for XR (3)**

Integer DRX cycles with drift adjustments:

[R2-2303861](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303861.zip) DRX cycle alignment for XR Nokia, Nokia Shanghai Bell, CMCC, China Unicom, DENSO CORPORATION, Ericsson, Intel, Google Inc., Huawei, HiSilicon, Samsung, Xiaomi discussion Rel-18 NR\_XR\_enh-Core

*Observation 1: all the solutions have no impact in RAN1 foreseen.*

*Observation 2: Option 1 with non-integer DRX cycle length is more complex from implementation point of view and numerical error remains even though the specification change is small.*

*Observation 3: For the variation of option 2 category with integer DRX cycle length, they differ mainly on the implementation/modelling, but they all result in the same OnDuration waking up pattern.*

*Observation 4: Option 3 with multiple active DRX cycle is more complex from procedure point of view and less power efficient, which defeats the purpose.*

*Proposal 1: Option 1 with non-integer DRX cycle values and option 3 with multiple active configurations are not considered further.*

*Proposal 2: Option 2 based on RRC configuration with integer DRX cycle value(s) is used for the UE to compensate the accumulated drift due to the misalignment of XR and DRX periodicities, considering e.g., adjusting the value of the start offset and/or DRX cycle is changed.*

*Proposal 3: Detailed RRC parameters to be introduced and how/if it would impact the formula in MAC depends on the modelling details with the different sub-options, which can be discussed further in the coming meetings.*

Rational number DRX cycles:

[R2-2302514](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302514.zip) DRX enhancements for XR Qualcomm Incorporated, MediaTek, CATT, vivo, NEC discussion Rel-18 NR\_XR\_enh-Core

*Observation 1. Options that necessitate multiple DRX cycles or multiple on durations within a DRX cycle have non-trivial impacts on RAN1/4 specs but do not offer better performance (e.g. delay, power savings) than others.*

*Proposal 1. Deprioritize options that require multiple DRX cycles or multiple on durations within a DRX cycle.*

*Observation 2. For the option with uniform DRX cycle expressed as a rational number, there are methods to implement modulo operation on rational numbers without rounding errors.*

*Observation 3. The option with uniform DRX cycle expressed as a rational number consistently introduces less amount of mismatch between the start of traffic and DRX cycles across various frame rates than the option with periodic adjustment of drx-StartOffset.*

*Observation 4. The option with uniform DRX cycle expressed as a rational number has much less impact on the legacy DRX formula than the option with periodic adjustments of drx-StartOffset.*

*Observation 5. There is no forward compatibility issue with the option with uniform DRX cycle expressed as a rational number, if the ASN.1 signaling for new DRX cycles is properly designed.*

*Proposal 2. Adopt the option with uniform DRX cycle expressed as a rational number.*

- Nokia thinks observation 3 may not be correct if you set the pattern differently (16, 16, 17).

- Nokia explains the rounding error analysis may also be different based on how the rational number is defined. QC explains this was one example. Different ways could have comparable performance.

- MTK agrees that if we adopt the numbers in 16.67 there can be rounding errors, but we can use rational numbers instead.

- LGE thinks observation 1 can be handled by shortest period. MTK thinks this is not correct since RAN1/4 tries to avoid UE waking up unnecessarily.

Multiple DRX cycles with integer lengths:

[R2-2303755](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303755.zip) Multiple DRX configuration for XR power saving LG Electronics Inc., InterDigital, NEC, ZTE discussion Rel-18 NR\_XR\_enh-Core

*Observation 1. Multiple active DRX configurations can support non-integer periodicity without high specification impact.*

*Observation 2. Multiple active DRX configurations are beneficial to support multiple flows for XR power saving.*

*Proposal 1. RAN2 support multiple active DRX configurations to resolve non-integer periodicity issue and to support power saving for multiple flows in XR.*

- Chair wonders how many DRX cycles there could be? LGE clarifies this could be discussed further but at most 9 with current DRX periodicities.

- Nokia thinks the main difference between multiple starting offsets and multiple DRXs is whether we call this as “DRX configuration” or not. So this is RRC details and modelling issue. But MAC procedure will be different.

- QC thinks this tries to have multiple DRX configurations which could be problematic for e.g. 144 Hz applications, which is used in gaming. That could require 18 configuration.

- Intel wonders if this would require L1 activation so UE knows which one is used? Thinks that was precluded in SI phase. LGE explains L1 activation is not considered but could be discussed if we go this way.

- Lenovo thinks this could have different timer settings since each DRX configuration is unique. Could have clashes with timers starting in async manner. LGE clarifies network would not configure long values for the timers.

[R2-2303359](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303359.zip) C-DRX enhancements for XR Apple discussion Rel-18 NR\_XR\_enh-Core

- Meta thinks different periodicity within a single flow does exist and we have to solve it. Thinks not all solutions solve the same problem.

- Huawei thinks we can preclude multiple DRX cycles. Multiple flows will mean some have large PDB so they can be sent together. Vodafone agrees with Huawei. Thinks we should preclude multiple active DRX cycles, UE could combine parameters to one set of parameters.

- Sony wonders if we would have multiple DRXs for one frame rate or for different flows?

- Apple thinks we should look at the bigger picture and multiple active DRXs could help.

- BT wonders if the UE could have multiple configurations but only one of them is active?

Options

?? Rational number for DRX cycle periodicity

?? DRX cycle adjustments

~~?? Multiple active DRX configurations~~

* RAN2 will not consider solution 3, i.e. multiple active DRX configurations as a solution to the non-integer periodicity for XR traffic, i.e. UE would have only one DRX configuration.

**Online (1st week Thursday) – SFN wrap-around issue (2)**

SFN wrap-around:

[R2-2302583](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302583.zip) Discussion on the SFN wrap-around problem for XR Huawei, HiSilicon, Nokia, Nokia Shanghai Bell, Qualcomm Incorporated discussion Rel-18 NR\_XR\_enh

*Observation1: Mismatch will emerge when DRX periodicities are non-divisors of 10240ms at SFN wrap-around.*

*Proposal1: Adopt the Rel-16 IIoT CG enhancement to address the issue of DRX cycle mismatch due to SFN wrap-around.*

* Introduce a sequential variable of DRX cycle for the formula calculating DRX cycles*

* Introduce a reference SFN indicator for DRX configuration*

[R2-2303302](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303302.zip) SFN wrap-around solution for XR DRX MediaTek Inc., CATT, LGE, Ericsson, NEC, DENSO discussion Rel-18 NR\_XR\_enh

*Observation 1: If C-DRX cycle values that are not factors of 10240 ms are introduced in XR, with legacy C-DRX formulas, DRX on-duration will go out of sync with XR traffic after the SFN wrap-around.*

*Observation 2: Extending the legacy DRX formulas by adding a term with a new counter has minimal impact on RAN2 specifications and is mostly aligned with the existing DRX mechanism.*

*Proposal 1: Resolve the SFN wrap-around issue for XR DRX by introducing a new counter in the C-DRX formula which is incremented every time SFN wraps around.*

- Intel agrees that SFN approach seems simpler. But thinks we could align the issue since multiple WIs address that so using reference SFN is also needed.

- Samsung thinks MTK solution is simple and can co-exist with non-integer periodicities. Should have future-proof solution so prefers MTK solution.

- vivo generally agrees with MTK solution but thinks we need a new configuration for reference SFN anyway. Can reuse eDRX H-SFN for that. Nokia thinks this is different from Intel solution. Would like to avoid broadcasting new H-SFN. Thinks we need a reference SFN anyway.

- Huawei also thinks we need reference SFN anyway. Thinks both solutions work and it’s just about which one is simpler. Thinks legacy solution has been there already so that’s why it is simpler. Just changes to MAC specs doesn’t tell everything about complexity. Adding new solutions to the same problem creates complexity. Lenovo agrees with Huawei. LGE agrees with MTK.

- MTK agrees reference SFN is anyway needed. Thinks also LTE eDRX is a legacy solution.

- Ericsson thinks we just need to initialize the counter correctly, which is simple. QC thinks this is not the whole problem since the same has to be done for each DRX configuration, which can be different.

* To address SFN wrap around, it is proposed to adopt option with a counter in DRX formula that increments at every SFN wrap around and an DRX reference SFN signalled by network. FFS if this is based on H-SFN, E-SFN or a generic counter.

[R2-2302599](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302599.zip) Discussion on power saving aspects for XR Continental Automotive discussion

[R2-2302710](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302710.zip) Discussing on XR-specific C-DRX enhancements Xiaomi Communications discussion

[R2-2302793](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302793.zip) XR-specific power saving enhancement Google Inc. discussion

[R2-2302811](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302811.zip) Discussion on DRX enhancements for XR Power Saving vivo discussion Rel-18 NR\_XR\_enh-Core

[R2-2302853](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302853.zip) XR-specific power saving ZTE Corporation, Sanechips discussion

[R2-2302896](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302896.zip) XR-specific power saving InterDigital discussion Rel-18 NR\_XR\_enh-Core

[R2-2302910](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302910.zip) Summary of DRX enhancements for XR traffic Intel Corporation, Sony discussion Rel-18 NR\_XR\_enh-Core

*Proposal 2. To address SFN wrap around, it is proposed to adopt option (A) a counter in DRX formula that increments at every SFN wrap around (based on H-SFN, E-SFN or a generic counter) and an explicit DRX reference SFN.*

[R2-2303132](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303132.zip) Discussion on C-DRX enhancement for XR NEC Corporation discussion Rel-18 NR\_XR\_enh-Core

[R2-2303227](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303227.zip) Discussion of DRX enhancement Lenovo discussion Rel-18

[R2-2303544](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303544.zip) Discussion on DRX enhancements CMCC discussion Rel-18 NR\_XR\_enh-Core

[R2-2303720](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303720.zip) Discussion on XR-specific power saving Ericsson discussion Rel-18 NR\_XR\_enh

[R2-2303867](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303867.zip) Discussion on power saving scheme for XR Samsung discussion Rel-18 NR\_XR\_enh

[R2-2303892](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303892.zip) Discussion on various frame rates supported for XR-specific power saving III discussion

[R2-2304172](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304172.zip) C-DRX enhancements for XR-specific power saving DENSO CORPORATION discussion Rel-18 NR\_XR\_enh-Core

### 7.5.4 XR-specific capacity improvements

No documents should be submitted to 7.5.4. Please submit to 7.5.4.x

#### 7.5.4.1 BSR enhancements for XR

Including discussion on details of new BSR table(s): Are they fixed or semi-static? Is linear or exponential stepping used? Will there be one or more new tables? Will a new BSR table be per LCH or per LCG? How will the delay/remaining time reporting work?

**Online (1st week Monday) – BSR table solutions (2-3)**

*BSR table: Semi-static or fixed, linear or exponential, how many tables?*

[R2-2302515](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302515.zip) BSR enhancements for XR Qualcomm Incorporated discussion Rel-18 NR\_XR\_enh-Core

*New BSR table*

*Observation 1. The range of a new BSR table can be determined by considering the size range of a XR video frame, which can be determined beforehand based on its encoding rate and frame rate.*

*Observation 2. Only a limited number of new BSR tables (e.g. 12) need to be defined. Each of them can be completely specified by up to 4 parameters.*

*Observation 3. The legacy number of code points can provide sufficiently accurate quantization for anticipated range of new BSR tables.*

*Observation 4. Keeping the number of code points in the new BSR tables the same as in the legacy one can help keep the format of the enhanced BSR MAC CE simple.*

*Observation 5. Parameters and formula used to generate a new BSR table should be defined in a way that different UE implementations can produce the same table.*

*Proposal 1. To reduce UE implementation and testing efforts, pre-define a basic set of new BSR tables in the specification.*

*Proposal 2. To provide more flexibility for network, additional new BSR tables can be generated on demand based on parameters configured by RRC.*

*Proposal 3. All new BSR tables have the same number of code points as in the legacy BSR table.*

*Proposal 4. For UE to generate a new BSR table, network configures minimum buffer size Bmin, whether step size is linear or exponential, and step size factor p.*

*Proposal 5. Buffer size Bk can be generated according to the following formula: B1 = Bmin, and Bk = Bk-1 + floor(BS x p), for k=2, …, N, where BS = Bmin if step sizes are linear and BS = Bk-1 if step sizes are exponential.*

*Proposal 6. Network can configure which BSR table(s) an LCG should use.*

*Proposal 7. An LCG uses its configured new BSR table for reporting if its buffer size is within the range of that BSR table. Otherwise, it uses the legacy BSR table for reporting.*

*Delay status reporting*

*Observation 6. It is not necessary for UE to report delay status of every QoS flow, e.g. those without stringent delay requirements.*

*Proposal 8. Network can configure which LCG(s) should report its delay status.*

*Proposal 9. UE triggers a DSR when an LCG configured for reporting and its associated L2 buffer has data whose remaining time drops below a configured triggering threshold.*

*Proposal 10. The remaining time that triggers a DSR is defined as the duration from the current time/slot till the delay deadline, where*

*- the delay deadline for a PDU in a PDU Set is defined as the time of the first received PDU in the PDU Set plus the PSDB of the associated QoS flow;*

*- the delay deadline for other PDUs is defined as the arrival time of a PDU plus PDB of its associated QoS flow.*

*Proposal 11. Network can also configure an LCG to periodically report its delay status.*

*Proposal 12. Network can configure one or more reporting thresholds for an LCG. For each reporting threshold, UE reports the amount of data whose remaining time is below that threshold.*

*Proposal 13. The remaining time reported in a DSR is the duration between the time when the DSR is transmitted and the delay deadline of the corresponding data (as defined in Proposal 10).*

* Focus on P1-7

- MTK wonders what the compromise here is? QC clarifies this offers benefits of two approaches that were discussed before. Thinks the RRC generation can address particular applications.

- CMCC wonders for P3, do we still use also 5-bit BSR? QC explains this can be clarified after the framework is agreed.

- vivo wonders how this new BSR is used with legacy BSR? Does UE only use the new one or is it in addition with legacy BSR? QC clarifies P7 handles this.

- Xiaomi wonders if we need 12 new BSR tables? QC thinks the number can be discussed and maybe 12 is a lot. Some frame rates are close to each other.

[R2-2303862](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303862.zip) BSR enhancements for XR Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_XR\_enh-Core

*Proposal 1: define a new reference XR BS table in MAC based reference values for video and frame rates, and apply RRC configured scaling factor on top for different data and frame rates.*

*Proposal 2: the scaling factor with the new reference table could be configured per LCG; otherwise if not configured, the LCG uses legacy table.*

*Proposal 3: the new 8-bit BS reference table can be used even if there is only one LCG with data available for transmission.*

*Proposal 4: when the remaining data for the LCG configured with new table falls out of the range of the new table, it falls back to use legacy BSR table, i.e., a LCG configured to use new table can be reported in legacy MAC CE as well.*

*Proposal 5: the MAC CE with new BSR table and the legacy BSR table are identified with different LCIDs, thus the NW knows reported LCGs used legacy table or the new table without other explicit indication.*

*Proposal 6: Define new BSR format to report remaining time information per LCG.*

*Proposal 7: the shortest remaining time of data buffered is reported as the remaining time for the LCG.*

*Proposal 8: both independent PDUs or PDUs conforming a PDU set are supported.*

* Focus on P1-4

[R2-2302851](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302851.zip) BSR enhancements for XR ZTE Corporation, Sanechips discussion

*- BSR format and remaining-time reporting*

*Observation 1: The network can map uplink traffic with a similar characteristics to a given logical channel and further group the logical channels with similar characteristics into an LCG*

*Observation 2: An LCG can also have a single logical channel if XR traffic with unique characteristics (e.g. PSDB) is mapped to this LC (i.e. no other PDU Sets have similar QoS requirements)*

*Observation 3: Current mechanism to use per LCG based BSR reporting has enough flexibility to cater for XR traffic.*

*- BSR quantization error and multiple BSR tables*

*Observation 4: The amount of over reported buffer data increases with the higher BSR indices (i.e., the error is larger when there is large amount of buffered data at the UE) because the BSR code points towards the higher BSR values are sparser.*

*Observation 5: With just one additional BSR included for the same logical channel, the quantization error for BSR reporting is significantly reduced (even with existing BSR tables)*

*Observation 6: The quantization error is fairly negligible at low values of BSR and hence the gains with the 2nd BSR being included for such small BSR values is also negligible.*

*- BSR format and remaining-time reporting*

*Proposal 1: For XR, the existing BSR reporting mechanism using per LCG based buffer size is reused*

*Proposal 2: The remaining-time for buffered data in UL is reported per LCG by the UE*

*Proposal 3: When more than one LC is mapped to an LCG, then the remaining-time reported by the UE corresponds to the data from the LC that has the shortest remaining-time left for the buffered data in UL*

*Proposal 4: In order to eliminate the uncertainty in the reported value of the remaining-time due to scheduling delays etc, the UE shall include an absolute time reference (e.g. SFN) as the remaining-time reference point*

*- BSR quantization error and multiple BSR tables*

*Proposal 5: UE can include up to 2 BSR indices for the same LCG to reduce the quantization errors for BSR (the first index indicating a coarse value for buffer size and the second index indicating a finer value on top of the value indicated by the first index)*

*Proposal 6: The UE should include the 2nd BSR index only if the quantization error is larger than a threshold that is configured by the network*

*Proposal 7: When two BSR indices per LCG are included (per P5 above), RAN2 should discuss if both the BSR indices should be from the same BSR table or not*

- vivo wonders for P6, does NW provide the threshold and UE determines the table? If so, how does NW know which table UE has used? ZTE clarifies that the inclusion of the 2nd index costs bits, so P6 tries to save the extra bits when they are not needed. Table issue is in P7.

- Samsung thinks there are two ways to include the BSR fields – which is preferred? ZTE explains they have no strong view and this can be discussed in Stage-3.

- LGE wonders if P6 means that this applies for LC or LCGs? ZTE clarifies they would prefer to stick to per-LCG operation.

* Focus on P5-7

Overall discussion (of all above)

- Ericsson has some simulation results with new tables in [R2-2303721](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303721.zip). Would like to clarify the transmission sizes are also impacted by the BSRs. Also thinks the multiple indexes is more complex and doing the semi-static tables is better.

- CATT has sympathy with QC approach but thinks UE will have many tables, and static could just be the legacy one. Can discuss how to do reporting later on.

- Apple wonders whether the current table is sufficient? Is fine with generated table but thinks UE input is needed to make it more accurate.

- Lenovo has some sympathy with ZTE solution since it could reduce overhead.

- Huawei would prefer compromise between QC and ZTE: Use legacy for static and pre-configure new table for XR. Can consider additional indexes for refinement as ZTE proposed to reduce quantization error.

- Intel thinks we should consider the actual values we use, and the number of new tables. Is the maximum size same as legacy etc.?

- ZTE thinks it’s wrong to optimize for the application-generated packet sizes. What’s important also how much is scheduled and how much is pending. Ericsson thinks it’s not random and simulations show otherwise. Thinks multiple indexes will still have higher errors with the large values.

- Vodafone wonders if ZTE solution needs new tables? ZTE clarifies it is not necessary but can work with those. Google thinks ZTE solution would be good.

- Nokia agrees with Ericsson that we could decide on the new table first and then whether we need another BSR reporting on top we can consider after that. Thinks QC proposal does not help UE implementation since they will have to implement both.’

- MTK agrees with Nokia that having both mechanisms doesn’t help UE implementation. Thinks picking one mechanism such as generating table would be useful. Thinks pre-configured table might have issues later on when codecs are updated, and wouldn’t want to generate more tables every released. Lenovo agrees.

- QC thinks the solution with pre-set tables is reducing UE computation effort. Most cases would use fixed tables.

- LGE thinks it would be good to make common ground on the new BSR table: Do we introduce it only for XR, or also for non-XR UEs? ZTE wonders this is a more general question and we normally don’t make MAC functionalities service-specific.

* Support of new BSR table(s) is based on NW configuration and UE capability. FFS whether the UE capability can apply to non-XR UEs.
* AT-meeting email [212] (QC) to discuss pros and cons of all solutions on the table. Aim to preclude least-supported solution(s). Determine the support level of solutions.

**AT-meeting offline discussions (started after 1st week Monday online)**

* [AT121bis-e][212][XR] BSR solutions (Qualcomm)

Scope: Attempt to find out which among the BSR table solutions have most support and preclude those with least support (if possible). Should discuss pros and cons of each solution and determine which are acceptable to companies (and why). Can also discuss other general details (e.g. how the BSR tables are used).

Intended outcome: Discussion report in [R2-2304394](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304394.zip).

Deadline: Deadline 2

**Online (2nd week Monday) – Report of [212] (1)**

[R2-2304394](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304394.zip) Report of [AT121bis-e][212][XR] BSR solutions (Qualcomm) Qualcomm discussion Rel-18 NR\_XR\_enh-Core

*“Easy” agreements*

*Proposal 1. (25/30) As a working assumption, at most one BSR index is reported by an LCG. This assumption can be revisited if new BSR table design cannot achieve a target level of quantization error. FFS what this target level should be.*

*Proposal 2a. (21/30) Deprioritize Option 2c (static + dynamic BSR tables. 6/3) and Option 2d (reference table + scaling factor. 5/30).*

*Proposal 3. (22/30) Design/configuration for new BSR table(s) should include support for narrower ranges than the legacy. Details can be discussed after an agreement on how UE obtains new BSR table(s) (e.g. pre-definition vs RRC configuration) is made.*

*Proposal 4. (26/30) If more than one new BSR table are introduced, all of them have the same number of code points. FFS the number of code points.*

*Proposal 5. (25/30) At least linear distribution is used for generating code points in new BSR table(s). FFS (13/25) whether exponential distribution can be considered too.*

*Proposal 6. (29/30) Network can configure which BSR table(s) an LCG is eligible to use. UE determines which one of those BSR tables the LCG should use based on its buffer size. FFS details of this determination.*

*Proposal 8. (29/30) New BSR table(s) can be used by any UEs that support such a capability. However, design of the new BSR table(s) should be based on XR-specific use cases and requirements.*

- Ericsson had some comments on the proposals. Thinks we should not tie these decisions to other aspects such as delay reporting.

- Interdigital thinks P4 seems to imply fixed BSR tables. For P2a, deprioritizing 2c means we go either with fixed or semi-static. QC clarifies P4 is more about BSR format and is not limited to fixed.

- Futurewei thinks P1 is under one instance of data volume report. For P6, does UE indicate which BSR table it uses dynamically? Xiaomi agrees.

- CMCC wonders if we will have single linear distribution or multiple ones, e.g. piecewise linear distribution? QC clarifies we didn’t discuss this. Thinks we can assume it’s included for now.

- Apple wonders for P3, whether the “narrower range” implies something on wider range? QC clarifies this has not been discussed so not sure we need to support that. Thinks if companies want to support always having narrower range, that could be possible.

- Intel wonders if P3 “range” means same as “Bmax”? QC clarifies the range is between min and max but we haven’t discussed those yet. Thinks interval between min and max is smaller than in legacy. Nokia thinks the legacy table is from zero to infinity already so we don’t need that for the new table. LGE thinks we can discuss this later.

- Samsung thinks the range depends on whether the table is fixed or semi-static.

Bulk agreements

* 1. As a working assumption, at most one BS index or BS value is reported by an LCG. This assumption can be revisited if new BSR table design cannot achieve a target level of quantization error. FFS what this target level should be.
* 3. Design/configuration for new BSR table(s) should include support for narrower ranges (i.e. finer granularity) than the legacy. Details can be discussed after an agreement on how UE obtains new BSR table(s) (e.g. pre-definition vs RRC configuration) is made.
* 5. At least linear distribution is used for generating code points in new BSR table(s). FFS whether exponential distribution can be considered too. FFS if piecewise linear distribution is supported.
* 8. New BSR table(s) can be used by any UEs that support such a capability. However, design of the new BSR table(s) should be based on XR-specific use cases and requirements.

*Online*

* 6. Network can configure which BSR table(s) an LCG is eligible to use. UE determines which BSR table (i.e. legacy or something else) the LCG should use. FFS details of this determination (e.g. based on buffer size) and how network knows which BSR table each LCG uses.

- QC thinks in the baseline case, UE has legacy table and new table. Most companies think UE has to determine which table to use. P6 aims to say granularity is LCG and not something else. Ericsson thinks there could be multiple tables. Nokia thinks it’s still FFS how many tables we need.

- Huawei thinks the BSR can include multiple BS for different LCGs.

* 4. As working assumption (depending on how we create the new BSR table(s) and the MAC CE format), If more than one new BSR table are introduced, all of them have the same size BS field. FFS on the exact size.

- Ericsson wonders why we need to limit the size? We could use smaller bit size and still get the gains? QC thinks the main impact is on the BSR MAC CE format. Having dynamic sizes for fields makes the design more complicated. FW thinks if the size doesn’t save bits, it doesn’t matter.

- CMCC thinks we aim to have lower quantization errors so it’s better to have the same BS field size. Ericsson thinks we could have different formats and multiple options, depending on how we create the tables.

* 2a. Deprioritize Option 2c (static + dynamic BSR tables) and Option 2d (reference table + scaling factor).
* 2b. Have more discussions on Option 2a (static BSR tables) vs Option 2b (RRC configured BSR tables). In next meeting, companies should explain how BSR table(s) are created and how many tables would be needed, and how the MAC CE structure will look like. Should also explain what is the expected quantization error.

- Ericsson thinks we need to also discuss the DSR. QC thinks the main arguments of dynamic configuration is the lower quantization errors. But companies may have different targets in mind. ZTE thinks the error should be as low as possible and the error is really only a problem for the higher range.

- ZTE wonders whether the DSR will be in the same report as BSR?

- LGE wonders if any company considered BS field > 8 bits? Thinks new table should be <=8 bits.

*Requires discussion*

*Proposal 7a. (19/30) As a baseline, new BSR table(s) is used only when a long BSR is to be reported (i.e. UE triggers a BSR with more than one LCG has buffered data). FFS (7/30) whether the same new BSR table(s) can also be used when a short BSR is to be reported.*

*Proposal 7b. (11/30) Whether a new BSR MAC CE format is needed can be discussed after new BSR tables are designed.*

[R2-2303114](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303114.zip) Discussion on BSR enhancement for delay information report NEC Corporation discussion Rel-18 NR\_XR\_enh-Core

[R2-2303328](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303328.zip) New BS table(s) and BSR trigger(s) NEC discussion Rel-18 FS\_NR\_XR\_enh

[R2-2303721](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303721.zip) Discussion on BSR enhancements for XR Ericsson discussion Rel-18 NR\_XR\_enh

[R2-2303826](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303826.zip) Discussion on MAC enhancements for XR-specific capacity improvement Huawei, HiSilicon discussion Rel-18 NR\_XR\_enh

[R2-2302757](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302757.zip) New BSR tables and delay report CATT, Dell Technologies discussion Rel-18 NR\_XR\_enh-Core

[R2-2302758](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302758.zip) PDU set BSR CATT, Dell Technologies discussion Rel-18 NR\_XR\_enh-Core

[R2-2303982](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303982.zip) Discussion on BSR enhancements for XR Samsung discussion Rel-18 FS\_NR\_XR\_enh

[R2-2302998](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302998.zip) Considerations on XR capacity improvements KDDI Corporation discussion NR\_XR\_enh-Core [R2-2300641](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2300641.zip)

*(moved from 7.5.4)*

[R2-2303530](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303530.zip) Consideration on BSR enhancement for XR CMCC discussion Rel-18 NR\_XR\_enh-Core

[R2-2304043](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304043.zip) Discussion on BSR enhancements for XR Google Inc. discussion Rel-18 NR\_XR\_enh-Core

[R2-2304089](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304089.zip) Discussion on residual resource allocation for XR Google Inc. discussion NR\_XR\_enh-Core

[R2-2303701](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303701.zip) Discussion on BSR Enhancements and Delay Information Meta discussion Rel-18 NR\_XR\_enh-Core

[R2-2302615](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302615.zip) BSR enhancements for XR MediaTek Inc. discussion Rel-18

[R2-2302527](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302527.zip) Discussion on BSR enhancements for XR Futurewei discussion Rel-18 NR\_XR\_enh-Core

[R2-2302709](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302709.zip) Discussing on BSR enhancements for XR capacity Xiaomi Communications discussion

[R2-2302812](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302812.zip) Discussion on BSR enhancements for XR vivo discussion Rel-18 NR\_XR\_enh-Core

[R2-2302911](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302911.zip) BSR enhancements for XR Intel Corporation discussion Rel-18 NR\_XR\_enh-Core

[R2-2302972](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302972.zip) Discussion on BSR enhancements for XR TCL Communication Ltd. Discussion

[R2-2303203](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303203.zip) Discussion on UE Feedback enhancements Lenovo discussion Rel-18 NR\_XR\_enh-Core

[R2-2303313](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303313.zip) Discussion on BSR enhancement for XR OPPO discussion Rel-18 NR\_XR\_enh-Core

[R2-2303343](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303343.zip) Considerations on new buffer status report table FGI discussion

[R2-2303360](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303360.zip) Views on BSR Enhancements for XR Apple discussion Rel-18 NR\_XR\_enh-Core

[R2-2303584](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303584.zip) BSR enhancement on XR Spreadtrum Communications discussion Rel-18

[R2-2303629](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303629.zip) BSR enhancements for XR Interdigital Inc. discussion Rel-18 NR\_XR\_enh-Core

[R2-2304008](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304008.zip) Discussion on BSR enhancement and delay information report LG Electronics Inc. discussion Rel-18 NR\_XR\_enh-Core

[R2-2303010](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303010.zip) Discussions on delay information reporting Fujitsu discussion Rel-18 NR\_XR\_enh-Core

[R2-2303083](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303083.zip) Considerations on XR UL PDU set information Sony discussion Rel-18 NR\_XR\_enh-Core

[R2-2303889](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303889.zip) Discussion on BSR enhancements for XR III discussion NR\_XR\_enh-Core

#### 7.5.4.2 Discard operation for XR

Including discussion how to achieve PDU-set based discard in PDCP layer for UL and DL (e.g. do we use discard timer or have another way to achieve the discard) and whether that can have impact to RLC layer.

Including discussion on impact of PSI and PSIHI for PDU discard at UE and what (if anything) needs to be specified in RAN2.

**Online (2nd week Wednesday) – PDU-set based discard mechanism in PDCP (1-2)**

[R2-2303303](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303303.zip) PDU discard based on PSDB and PDU set importance MediaTek Inc. discussion Rel-18 NR\_XR\_enh [R2-2301371](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2301371.zip)

*Observation 1: A partial/complete PDU-set discard operation when the PSDB is exceeded can be useful to reduce congestion and priortise new data in some cases.*

*Observation 2: In case of differential encoded video, PDB/PSDB expiry cannot be used as a trigger for PDU discard as the information is still needed to decode future frames.*

*Observation 3: In cases where PSDB expiry based PDU discard cannot be used (e.g. differentially encoded information), it is useful to drop all earlier PDU sets in the transmission buffer of the transmitter when a PDU set of high importance arrives, to ease congestion and to ensure that newly arriving independent video frames can be provided to the end-user in a timely manner.*

*Observation 4: Window stalls at the receiver entity as a consequence of discarded PDUs by the transmitter entity is undesirable for delay-sensitive XR traffic.*

*Proposal 1: PDU discard based on PSDB expiry can be left to NW implementation on the downlink.*

*Proposal 2: PDU discard based on PSDB expiry is modelled using the existing PDCP discard timer for the uplink.*

*Proposal 3: In cases where jitter exists for the uplink, expiry of the PDCP discard timer of a PDU that belongs to a PDU set can trigger discard of all PDUs that belong to that PDU-set.*

*Proposal 4: Arrival of a PDU set with high importance can trigger the discard of all PDU sets that arrived earlier.*

*Proposal 5: The receiver entity is notified of any PDUs that are discarded by the transmitter entity to avoid window stalls.*

* Focus on P2-P5

*Proposal 2: PDU discard based on PSDB expiry is modelled using the existing PDCP discard timer for the uplink.*

*Proposal 3: In cases where jitter exists for the uplink, expiry of the PDCP discard timer of a PDU that belongs to a PDU set can trigger discard of all PDUs that belong to that PDU-set.*

- For P2, OPPO wonders if we use only one PDCP discard timer, how does UE know which timer to use? MTK assumes there will be some configuration on this. Ericsson thinks one timer is enough. Doesn’t think we need to couple this with jitter. MTK thinks we could reuse the same PDCP discard timer.

- QC this is mostly a modelling issue. But for UE implementation, a single timer per PDU set is simpler.

- Intel thinks PDU set based discard timer is needed, especially to support the case when PDUs of a PDU set arrive sequentially or spread over time because in this case the existing discard timer cannot account for inter-arrival delay of PDUs in the PDU set.

- Huawei, Nokia, Xiaomi and Lenovo supports P2-3. CATT wonders if all PDUs arrive at the same time.

- MTK clarifies assumption is not that all data arrives simultaneously. But if PDU timer expires for any PDU, it’s the same for all PDUs. Intel thinks this is only about PSIHI case.

- Apple thinks One PDU Set timer is preferred, but not for each PDU

- LGE thinks this is only a modelling issue. In legacy we use timer per SDU. Same behaviour whether we have per PDU or per PDU set timer.

* 2: PDU set discard is modelled using the existing PDCP discard timer for the uplink. The timer is in network control.

*Proposal 4: Arrival of a PDU set with high importance can trigger the discard of all PDU sets that arrived earlier.*

*Proposal 5: The receiver entity is notified of any PDUs that are discarded by the transmitter entity to avoid window stalls.*

[R2-2303722](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303722.zip) Discussion on PDU Discard Ericsson discussion Rel-18 NR\_XR\_enh

*Proposal 1 UE PDU Set discard timer is used by the UE if configured by the network.*

*Proposal 2 When PDU Set discard timer is configured the PDCP discard timer is disabled.*

*Proposal 3 One PDU Set discard timer is started for each PDU Set.*

*Proposal 4 Allow RRC to change discard timer values*

*Proposal 5 The NW may configure the PDU set discard timer with at least 2 timer values which the UE will apply when no PSI levels are configured by the network.*

*Proposal 6 If the UE cannot identify the PSI level of the PDU Sets, the UE applies the same timer values as when no PSI levels are configured by the NW, if the timer value was configured.*

*Proposal 7 If the UE supports PSI identification and can identify the PSI levels, the NW may configure PSI levels so that:*

*1. Each PSI level may be associated with at least 2 different PDU set discard timer values.*

*2. PSI levels are defined in order of importance: the first PSI level is the most important while the last defined PSI is the least important.*

*Proposal 8 PDCP CEs are used to indicate which PDU Set discard timer value is applied.*

*Proposal 9 PDCP CE may, in addition, also indicate the PSI and PDU set discard timer value when PSIs are used*

* Focus on P2-3, P8-9

*Proposal 2 When PDU Set discard timer is configured the PDCP discard timer is disabled.*

*Proposal 3 One PDU Set discard timer is started for each PDU Set.*

*Proposal 8 PDCP CEs are used to indicate which PDU Set discard timer value is applied.*

*Proposal 9 PDCP CE may, in addition, also indicate the PSI and PDU set discard timer value when PSIs are used*

[R2-2303801](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303801.zip) Discard operation for XR CMCC discussion Rel-18 NR\_XR\_enh-Core

[R2-2303788](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303788.zip) Discussion on PDU discard NTT DOCOMO, INC. discussion

[R2-2303700](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303700.zip) Discussion on PDU Discard Operation for XR Meta discussion Rel-18 NR\_XR\_enh-Core

[R2-2302720](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302720.zip) Discard operation for XR Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_XR\_enh-Core

[R2-2302759](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302759.zip) Discard Operation for XR CATT discussion Rel-18 NR\_XR\_enh-Core

[R2-2302854](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302854.zip) PDU discard for XR ZTE Corporation, Sanechips discussion

[R2-2302964](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302964.zip) Discard Operation for XR Samsung R&D Institute India discussion Rel-18

[R2-2302516](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302516.zip) Discussion on discard operation for XR Qualcomm Incorporated discussion Rel-18 NR\_XR\_enh-Core

[R2-2302708](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302708.zip) Discussing on PDU discarding of XR traffic Xiaomi Communications discussion

[R2-2302813](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302813.zip) Discussion on discard operation for XR vivo discussion Rel-18 NR\_XR\_enh-Core

[R2-2302897](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302897.zip) Discard operation for XR InterDigital discussion Rel-18 NR\_XR\_enh-Core

[R2-2302912](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302912.zip) Discard operation for XR Intel Corporation discussion Rel-18 NR\_XR\_enh-Core

[R2-2302937](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302937.zip) Discussion on discard operation for XR Futurewei discussion Rel-18 NR\_XR\_enh-Core

[R2-2302970](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302970.zip) Discussions on discard operation for XR TCL Communication Ltd. discussion

[R2-2303011](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303011.zip) Discussions on PDU discard based on PDU Set Importance Fujitsu discussion Rel-18 NR\_XR\_enh-Core

[R2-2303199](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303199.zip) Discussion on discarding operation for XR Motorola Mobility France S.A.S discussion Rel-18 NR\_XR\_enh-Core

[R2-2303314](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303314.zip) Discussion on discard operation for XR OPPO discussion Rel-18 NR\_XR\_enh-Core

[R2-2303329](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303329.zip) PDU discard NEC discussion Rel-18 FS\_NR\_XR\_enh

[R2-2303361](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303361.zip) Views on PDU Discard Operation for XR Apple discussion Rel-18 NR\_XR\_enh-Core

[R2-2303579](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303579.zip) Discussion on XR discard Spreadtrum Communications discussion Rel-18

[R2-2303830](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303830.zip) Discussion on PDU set discarding for XR traffic Huawei, HiSilicon discussion Rel-18 NR\_XR\_enh

[R2-2303931](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303931.zip) Discussion on PDU Set discard in PDCP layer for DL and UL ASUSTeK discussion Rel-18 NR\_XR\_enh-Core

[R2-2303999](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303999.zip) Discussion on the discard for XR LG Electronics Inc. discussion NR\_XR\_enh-Core

#### 7.5.4.3 Configured Grant enhancements for XR

Including RAN2-specific aspects of Multiple Configured Grant (CG) PUSCH transmission occasions in a period of a single CG PUSCH configuration.

Including RAN2-specific aspects of dynamic indication of unused CG PUSCH occasion(s) based on Uplink Control Information (UCI) by the UE.

Including discussion on how retransmission-less CG defined for NTN could work with XR (as per RAN#99 discussion).

NOTE: Topics other than retransmission-less CG may be deprioritized in this meeting.

**AT-meeting offline discussions (started at meeting start)**

* [AT121bis-e][210][XR] Retransmission-less CG for XR (Huawei)

Scope: Discussion whether Rel-17 NTN solution for retransmission-less CG can work for XR (based on contributions to this meeting, e.g. [R2-2302584](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302584.zip)). Can also provide draftCR illustrating the changes.

Intended outcome: Discussion report in [R2-2304391](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304391.zip)

Deadline: Deadline 1

**Online (1st week Thursday) – Report of [210] (1)**

[R2-2304391](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304391.zip) Report of [AT121bis-e][210] Retransmission-less CG for XR (Huawei) Huawei discussion Rel-18 NR\_XR\_enh-Core

*Proposal1: CG is suitable for the transmission of uplink pose control information. (24/24)*

*Proposal2: Reusing legacy R15/16 CG for pose control information is detrimental for UE power saving when the XR frame rate is low (e.g., 60fps) (19/23)*

*Proposal3: For the power saving of transmitting pose control information, RAN2 to down-select from the following two options:*

* Option1: Adapt the NTN solution by disabling the HARQ RTT timer per CG configuration for CG. Sample TP in Annex A of* [*R2-2304391*](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304391.zip) *(13/24)*

* Option2: Adapt the NTN solution by disabling the HARQ RTT timer per HARQ processes for both CG and DG. Sample TP in Annex B of* [*R2-2304391*](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304391.zip)*. (6/24)*

- MTK thinks we are addressing the issue of frequent UL transmissions. DG can be used but they require UE to be awake all the time. In DRX UE is in sleep, so only CG really works.

- Ericsson thinks we need not discuss CG vs. DG. Thinks we can downselect to the two options. Would prefer to reuse the NTN solution.

- ZTE thinks option 3 is “do nothing”. Prefers simple solutions so NTN solution seems best. Thinks pose information is anyway aligned with frame rate, but here the problem is when it’s not so it’s not clear if the problem is clear.

- LGE thinks it’s important whether we allow HARQ process with different CG. All process in one CG configuration should have only one retransmission mode. Ericsson explains this was already discussed in NTN and is up to network configuration. LGE would like to restrict to specific HARQ processes.

* There is support to adopt NTN solution for the retransmission-less CG.
* If adopted, RAN2 aims to only consider option1 or option 2:

Option1: Adapt the NTN solution by disabling the HARQ RTT timer per CG configuration for CG.

Option2: Adapt the NTN solution by disabling the HARQ RTT timer per HARQ processes for both CG and DG.

* FFS how the solution ensures consistent HARQ operation.

*Proposal4: If Option1 is agreeable, consider the following potential issues in the text proposal*

* Name of the parameter in RRC for retx-less CG*

* Interworking with the CGT*

* Support of blind retransmission*

* LCP restriction*

* Mechanisms to guarantee reliability*

[R2-2302584](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302584.zip) Discussion on retransmission-less CG for XR Huawei, Apple, Google, HiSilicon, Intel, Lenovo, MediaTek, Meta, Nokia, Nokia Shanghai Bell, Qualcomm Incorporated discussion Rel-18 NR\_XR\_enh

[R2-2302517](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302517.zip) Enhancements to configured grant for XR Qualcomm Incorporated discussion Rel-18 NR\_XR\_enh-Core

[R2-2302760](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302760.zip) On the need for retransmission-less CG for XR CATT discussion Rel-18 NR\_XR\_enh

[R2-2302792](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302792.zip) Configured Grant enhancements for XR Google Inc. discussion

[R2-2302852](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302852.zip) Configured Grant enhancements for XR ZTE Corporation, Sanechips discussion

[R2-2302898](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302898.zip) Configured Grant enhancements for XR InterDigital discussion Rel-18 NR\_XR\_enh-Core

[R2-2303084](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303084.zip) Retransmission-less CG for some XR traffic Sony discussion Rel-18 NR\_XR\_enh-Core

[R2-2303085](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303085.zip) Configured Grant enhancements for XR Sony discussion Rel-18 NR\_XR\_enh-Core

[R2-2303198](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303198.zip) Discussion of CG enhancements Lenovo discussion Rel-18 NR\_XR\_enh-Core

[R2-2303315](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303315.zip) Discussion on configured grant enhancement for XR OPPO discussion Rel-18 NR\_XR\_enh-Core

[R2-2303362](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303362.zip) Views on Configured Grant Enhancements for XR Apple discussion Rel-18 NR\_XR\_enh-Core

[R2-2303839](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303839.zip) Configured Grant enhancements for XR Ericsson discussion Rel-18 NR\_XR\_enh

[R2-2303863](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303863.zip) CG enhancements for XR Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_XR\_enh-Core

[R2-2303891](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303891.zip) Discussion on Configured Grant enhancements for XR III discussion NR\_XR\_enh-Core

[R2-2304009](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304009.zip) Discussion on retransmission-less CG for XR LG Electronics Inc. discussion Rel-18 NR\_XR\_enh-Core

[R2-2304120](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304120.zip) Retransmission-less CG for XR MediaTek Inc. discussion Rel-18

[R2-2302814](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302814.zip) Discussion on CG enhancements for XR vivo discussion Rel-18 NR\_XR\_enh-Core

[R2-2303987](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303987.zip) Multiple CG occasions and retransmission-less CG Samsung discussion Rel-18 NR\_XR\_enh-Core

[R2-2303531](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303531.zip) Consideration on Configured Grant enhancement for XR CMCC discussion Rel-18 NR\_XR\_enh-Core

## 7.14 Enhancement on NR QoE management and optimizations for diverse services

(NR\_QoE\_enh-Core; leading WG: RAN3; REL-18; WID: RP-223488)

Time budget: 1 TU

Tdoc Limitation: 2 tdocs

### 7.14.1 Organizational

Including LSs and any rapporteur inputs (e.g. work plan)

**Online (1st week Wednesday) – Work plan (1)**

[R2-2304084](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304084.zip) Revised Work Plan for Rel-18 NR QoE Enhancement China Unicom Work Plan NR\_QoE\_enh-Core

* Endorsed

**Online (1st week Wednesday) – LSs (3+1)**

[R2-2302425](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302425.zip) LS on assistance information for handling of QoE reporting upon RAN overload (R3-231028; contact: Huawei) RAN3 LS in Rel-18 NR\_QoE\_enh-Core To:RAN2

- Lenovo thinks we don’t need to discuss this in this meeting. But thinks the LS action looks a bit strange as RAN2 is invited for feedback although RAN3 made an agreement.

- Huawei thinks this is also related to the SA5 LS and the measurements for IDLE/INACTIVE.

* Noted (can be discussed in May meeting)

[R2-2302461](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302461.zip) Reply LS on QoE measurements in RRC IDLE/INACTIVE states (S5-232760; contact: Huawei) SA5 LS in Rel-18 NR\_QoE\_enh-Core To:RAN2, RAN3 Cc:SA4

* Noted

[R2-2302463](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302463.zip) LS on Approval of eQoE CRs for NR (S5-232997; contact: Ericsson) SA5 LS in Rel-18 eQoE To:RAN2, RAN3, SA4, CT1, CT4

* Noted

**AT-meeting offline discussions (started earliest after 1st Week Wednesday session)**

* [AT121bis-e][221][QoE] LS replies to QoE (Huawei)

Scope: Determine whether to send replies to LSs received from other groups (e.g. RAN3, SA4 and SA5) and attempt to provide RAN2 reply. If LS reply is agreeable, discussion should also determine what to reply and what the target groups are (for To and Cc).

Intended outcome: LS out to SA4/SA5 in [R2-2304396](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304396.zip) (if agreed).

Deadline: Deadline 4

- Huawei thinks we could send two LSs. Ericsson is not sure we need reply LSs. Chair clarifies whether to send LSs is part of the offline discussion.

**By Email [221] or Online (2nd week Tuesday) – Report of [221] (1)**

[R2-2304529](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304529.zip) Report of [AT121bis-e][221][QoE] LS replies to QoE) Huawei, HiSilicon discussion Rel-18 NR\_QoE\_enh-Core

*Potential easy agreements:*

*Proposal 4: As a default behavior, when the UE’s buffer for storing QoE reports is full and a new report arrives, the UE should discard older report(s) to make room for the new one.*

*Proposal 5: It should be possible to provide QoE selection policies to the UE, e.g. for the UE to decide which reports to discard in case the UE’s QoE buffer becomes full.*

*Proposal 7: Agree on the draft LS provided in* [*R2-2304019*](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304019.zip)*.*

*Wording proposed by Lenovo:*

*Proposal 7: Agree on the draft LS provided in* [*R2-2304019*](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304019.zip) *with following modification: add the sentence “RAN2 thinks that there is no impact on RAN2 specifications from SA5 agreements”.*

*Potential easy agreements:*

* 4: As a default behavior, when the UE’s buffer for storing QoE reports is full and a new report arrives, the UE should discard older report(s) to make room for the new one.
* 5: FFS whether it is possible to provide information (e.g. priority, service type, etc.) to UE about buffering for the UE to decide which reports to discard in case the UE’s QoE buffer becomes full.

- Lenovo thinks P5 is up to RAN3 and P4 is the baseline. Huawei clarifies RAN3 only discussed the OAM/CN priorities and these need not be forwarded to UE.

- Apple wonders if there are any other cases where UE needs the selection policy?

- Vodafone wonders if P5 is in RAN2 scope? Huawei thinks this would be AS policy.

*Require further discussion:*

*Proposal 1: For MBS broadcast services:*

*- Area scope is checked by the UE when the UE is in RRC IDLE/INACTIVE state.*

*- FFS whether area scope is checked by the network or by the UE when the UE is in RRC CONNECTED state for MBS broadcast services.*

*Proposal 2: Discuss further whether area scope checking for MBS broadcast is done by:*

*- UE Application layer (6/10)*

*- UE AS layer (3/10)*

* 1: For MBS broadcast services:

- Area scope is checked by the UE when the UE is in RRC IDLE/INACTIVE state.

- FFS whether area scope is checked by the network or by the UE when the UE is in RRC CONNECTED state for MBS broadcast services.

- Ericsson thinks P2 is discussed in RAN3. Huawei thinks RAN3 left it up to RAN2 to decide.

* 2: FFS whether area scope checking for MBS broadcast is done by UE Application layer. FFS if this is for all RRC states.

**Online (2nd week Wednesday) – LS outs from [221] (2)**

Replies to SA4/5 LSs:

[R2-2303597](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303597.zip) [DRAFT] Further reply LS to SA4 on QoE measurements in RRC IDLE/INACTIVE Huawei, HiSilicon LS out Rel-18 NR\_QoE\_enh-Core To:SA4 Cc:RAN3, SA5

*(moved from 7.14.2)*

* Postponed (handled in the next meeting based on online decisions)

[R2-2303599](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303599.zip) [DRAFT] Further reply LS to SA5 on QoE measurements in RRC IDLEINACTIVE states Huawei, HiSilicon LS out Rel-18 NR\_QoE\_enh-Core To:SA5 Cc:RAN3, SA4

*(moved from 7.14.2)*

* Postponed (handled in the next meeting based on online decisions)

[R2-2304019](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304019.zip) Draft reply LS on eQoE CRs for NR Lenovo LS out Rel-18 eQoE, NR\_QoE\_enh-Core To:SA5 Cc:RAN3, SA4, CT1, CT4

* Revised in [R2-2304396](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304396.zip)

[R2-2304396](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304396.zip) [DRAFT] Reply LS on eQoE CRs for NR Lenovo LS out Rel-18 NR\_QoE\_enh-Core To: SA5 Cc:RAN3, SA4, CT1, CT4

- CATT thinks there is a typo in 28.404 – should be 28.405

* Use 28.405 instead of 28.804 in the text
* Use S5-232115 instead of S5-23115
* Remove [DRAFT] from title and use RAN2 as source
* With the above changes, the LS is approved (unseen) in [R2-2304401](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304401.zip)

[R2-2304401](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304401.zip) Reply LS on eQoE CRs for NR RAN2 LS out Rel-18 NR\_QoE\_enh-Core To: SA5 Cc:RAN3, SA4, CT1, CT4

* Approved

[R2-2304399](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304399.zip) Further reply LS to SA4 on QoE measurements in RRC IDLE/INACTIVE RAN2 LS out Rel-18 NR\_QoE\_enh-Core To:SA4 Cc:RAN3, SA5

* Withdrawn

**Online (1st week Wednesday) – Running CRs (1)**

[R2-2303676](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303676.zip) Running CR for QoE measurements Ericsson draftCR Rel-18 38.331 17.4.0 NR\_QoE\_enh-Core

* Noted (can be further refined based on this meeting decisions)
* Companies are encouraged to provide comments on the CR to rapporteur(s) offline.
* Stage-2 and RRC CR rapporteurs to provide updated version to RAN2#122 for endorsement.

**Online (2nd week Tuesday) – New LS (1)**

[R2-2304492](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304492.zip) Reply LS on buffer level threshold-based RVQoE reporting (S4-230684; contact: Apple) SA4 LS in Rel-18 NR\_QoE\_enh-Core To:RAN2 Cc: RAN3

*SA4 thanks RAN2 on their LS on buffer level threshold-based RVQoE reporting. Given that*

*• There already exists mechanism before Rel-18 for application layer to be configured for QoE reporting, and that this mechanism can be reused by the application layer to do RVQoE reporting based on the trigger of the buffer level threshold, and*

*• The application layer can make a buffer-threshold based decision in a more timely fashion compared to the AS layer, since the corresponding application layer reporting, based strictly on reporting periodicity, may be unable to submit QoE reports at the exact time that buffer level threshold is reached. As result, and depending on the reporting periodicity, the delay between a threshold occurrence and the next scheduled QoE report may precluding a more timely remedial response by the gNB.*

*Hence SA4 can confirm RAN2 preference that application layer triggering of buffer level threshold-based RVQoE reporting can be supported in Rel-18 based on the corresponding QoE configuration received from the AS layer.*

* Noted (any RAN2 actions can be considered in RAN2#122)

### 7.14.2 QoE measurements in RRC\_IDLE INACTIVE

Including discussion on whether something on MBS QoE configuration can be provided in RRCRelease-message, and how would such indications work with configuration provided in RRCReconfiguration.

Including discussion on AS layer buffer size (e.g. how many values, what is the minimum value).

Including discussion on what AS layer stores in IDLE/INACTIVE and what exactly is sent to AL.

Including discussion on handling area scope for MBS QoE and how long will UE retain the QoE configuration in IDLE/INACTIVE.

**Online (1st week Wednesday) – RRC configuration details and area scope (2-3)**

[R2-2303363](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303363.zip) QoE Measurements in IDLE/INACTIVE States Apple discussion Rel-18 NR\_QoE\_enh-Core

*Proposal 1: RRC-Reconfiguration and RRC-Resume can be used to configure multiple application layer measurement configurations (as in Rel-17), and RRC-Release message can be used to indicate which of these configured application layer measurement configurations should be used by the UE while it is in RRC\_IDLE or RRC\_INACTIVE.*

*Proposal 2: RAN2 should confirm the agreed baseline that, in Rel-18 the UE does not proactively enter RRC\_CONNECTED state just for the sake of QoE reporting.*

*Proposal 3: When the UE moves to RRC-CONNECTED state and indicates that there is QoE measurement available in RRCResumeComplete message:*

*• The network can request the UE to report the stored QoE measurements using UEInformationRequest message.*

*• The UE can report the stored QoE measurements using UEInformationResponse message.*

* Focus on P1, 3

P1

- Ericsson thinks that if we add indication in RRCRelease, we could also add configuration. This also saves one procedure. Should add all or nothing.

- China Unicom supports using RRCRelease but is not sure about P1: Which parts can we indicate?

- Huawei thinks companies may have different assumptions: Since these are for MBS broadcast, they can be for all states. So there is no need to provide new configuration in RRCRelease, just whether to continue/start the measurements in IDLE/INACTIVE. Ericsson agrees and thinks the network can indicate upon configuration whether the configuration is applicable for Idle/Inactive. No need to indicate that separately

- ZTE supports use of RRCRelease to modify configuration and thinks Apple proposal is a compromise.

- CATT supports RRCRelease for configuration. This can reduce signalling overhead during CONNECTED.

- CMCC thinks RAN3 agreed to use same QoE configuration for all RRC states so no need to modify. QC agrees with CMCC: Release could only provide new configurations.

- Nokia agrees with Huawei. So thinks indication on which configurations to continue is fine.

- Samsung agrees with Huawei. OAM has already decided on whether the configuration is used in IDLE/INACTIVE.

- China Unicom wonders if OAM sends new configuration to UE and UE is in RRC\_IDLE/INACTIVE, what happens?

- ZTE wonders if this means we need to add indication in RRC configuration about state applicability?

* 1: RRC Release message is not used for configuring QoE measurements for MBS broadcast.

P3

- Lenovo is not convinced we need a separate procedure. Could reuse existing ones. Also segmentation is not supported yet. Ericsson agrees with Lenovo and would like to use the existing procedure. NW can request the report by configuring SRB4. Nokia and Huawei agrees.

* 3: When the UE moves to RRC-CONNECTED state and indicates that there is QoE measurement available in RRC{Setup,Resume}Complete message. Network then retrieves the report by configuring the SRB4/5 for QoE reporting and using the Rel-17 reporting mechanism.

[R2-2303596](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303596.zip) Discussion on QoE measurements for MBS broadcast services Huawei, HiSilicon discussion Rel-18 NR\_QoE\_enh-Core

*MBS QoE configuration*

*Proposal 1: RRC Release message is not used for configuring QoE measurements for MBS broadcast.*

*Observation 1: Only a limited number of UEs receiving MBS broadcast service needs to be configured for QoE measurements for the network to obtain a good representation of the service quality in a specific area.*

*Observation 2: There are numerous aspects and issues which would have to be resolved in order to support QoE configuration via broadcast, i.e. signalling details, UE procedures, signaling overhead issues, impact to MBS UEs and MBS performance, coordination between dedicated and common configurations etc.*

*Proposal 2: QoE measurement configuration via broadcast signaling (e.g. System Information, MCCH/MTCH etc.) is not supported.*

*-* Lenovo wonders if P2 is for configuration or also for release? Huawei clarifies it’s only for configuration but release is also not needed. Lenovo thinks that if configuration is available only for INACTIVE, but UE moves to IDLE. What happens then? Huawei clarifies this wouldn’t change anything and thinks we would not have cases only for INACTIVE.

*-* ZTE thinks we already agreed that NW can paging UE to release the configuration.

* 2: QoE measurement configuration via broadcast signaling (e.g. System Information, MCCH/MTCH etc.) is not supported. FFS if the release of configuration can happen via broadcast.

*MBS QoE measurements reporting*

*Observation 3: Resuming/setting up an RRC connection just for the sake of reporting QoE brings no benefits while it causes MBS broadcast service performance deterioration, increases signaling overhead, impacts UE battery life and brings additional complexity.*

*Proposal 3: The UE does not setup/resume RRC connection just for QoE reporting, i.e. the QoE reports are sent to the network when the UE moves to RRC\_CONNECTED state due to other reasons.*

*Proposal 4: If the UE is in RRC\_CONNECTED and receives QoE report for MBS broadcast from the application layer, the UE sends the report according to the QoE reporting procedure from Rel-17, i.e. the report is not stored but sent immediately (unless paused).*

- Lenovo thinks we can remove “immediately”.

* 4: If the UE is in RRC\_CONNECTED and receives QoE report for MBS broadcast from the application layer, the UE sends the report according to the Rel-17 QoE reporting procedure.

*QoE configuration storage*

*Proposal 5: The network indicates per QoE configuration whether the QoE configuration is applicable to RRC\_INACTIVE/RRC\_IDLE states (i.e. that the QoE measurements are supposed to be gathered also in RRC\_IDLE/INACTIVE).*

*Proposal 6: For QoE configurations applicable to RRC IDLE, the UE AS layer stores all the RRC parameters except for QoE container.*

*Proposal 7: For QoE configurations applicable to RRC IDLE, the UE APP layer stores all the parameters forwarded from AS layer.*

- QC thinks all MBS configurations can be stored by default. so UE just stores whatever configurations there are and then uses them. OAM is not going to send the state applicability. Huawei thinks this depends on whether MBS is a service type and that hasn’t been decided in RAN3. China Unicom agrees with QC.

* 5: The QoE configuration indicates the applicable states (i.e. that the QoE measurements for CONNECTED are supposed to be gathered also in RRC\_IDLE/INACTIVE). FFS whether this is explicit or implicit.
* 6: For QoE configurations of MBS QoE in RRC IDLE, UE AS layer does not store the QoE container but stores QoE configuration ID and service type. FFS if UE AS layer stores something else.
* 7: For QoE configurations MBS QoE in RRC IDLE/INACTIVE, the UE APP layer stores all the parameters forwarded from AS layer.
* For INACTIVE, FFS what else UE AS layer stores.

- Lenovo wonders why is RRC\_INACTIVE missing? Huawei clarifies this was only discussed for IDLE before. For INACTIVE AS layer stores everything. Lenovo thinks current QoE is stored in inactive context. Huawei is fine to add INACTIVE. Ericsson is not sure we need to store e.g. pause so could store only some variables.

- Intel wonders why we need to store the parameters in AS layer if they are in AL? Huawei clarifies AL will provide the reports based on the AS parameters, then puts them in report sent in AS.

*Buffering of QoE reports*

*Proposal 8: Timer based QoE configuration release is not supported, i.e. the UE stores the IDLE/INACTIVE QoE configuration until it is released by the network.*

*Proposal 9: As a default behavior, when the UE’s buffer for storing QoE reports is full and a new report arrives, the UE should discard older report(s) to make room for the new one.*

*Proposal 10: Assistance information agreed by RAN3 for handling of QoE reporting upon RAN overload can be forwarded to the UE for the UE to decide which reports to discard in case the UE’s QoE buffer becomes full.*

*Observation 4: The memory requirements for storing QoE reports generated for MBS broadcast in RRC\_IDLE/INACTIVE states will be much higher than in case of pause due to RAN overload.*

*Proposal 11: RAN2 will introduce UE capability signaling for support of QoE reports buffer size(s) larger than 64kB. Exact values to be supported FFS.*

*Area scope checking*

*Observation 5: SA4 specifications already provide a readily available solution for handling QoE measurement area scope for MBS broadcast services.*

*Observation 6: for QoE measurements in RRC IDLE/IANCTIVE state, it is not possible for the network to perform area scope checking.*

*Proposal 12: Area scope verification for QoE collection for MBS broadcast should be performed by the application layer.*

*Selection of UEs for MBS QoE configuration*

*Observation 7: Forcing the gNB to utilize blind configuration of MBS broadcast QoE to all MBS capable UEs is sub-optimal for both the UE and the network in terms of signaling overhead, memory/storage requirements, predictability of receiving QoE measurements etc.*

*Proposal 13: RAN2 should investigate the means for the gNB to identify which UEs should be provided with MBS broadcast QoE configuration for a specific MBS session via, e.g.:*

*3. Allowing the network to indicate to the UE the IDs of MBS broadcast sessions for which it is interested in receiving QoE measurements.*

*4. The UE indicating to the network when the UE is configured with or receiving/starting to receive the indicated MBS sessions.*

* Focus on P1-2, 4-7

[R2-2303642](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303642.zip) On QoE measurements in RRC IDLE and INACTIVE Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_QoE\_enh-Core

*Observation 1: The area scope of a QoE configuration can be provided within the QoE configuration container in UE’s Application layer, which is already supported in current specification.*

*Observation 2: The area scope can be checked in UE’s application layer at the start of a QoE session.*

*Proposal 1: RRCRelease can be used to inform UE the continuity of application layer measurement configurations for UEs being in RRC idle and RRC inactive state.*

*Proposal 2: The gNB can indicate the RRC ID(s) for the QoE collection to be maintained/continued in RRCRelease message.*

*Proposal 3: RAN2 to discuss how to store the QoE configurations for MBS based on the conclusion of Area Scope handling for UE in RRC Idle/inactive.*

*Proposal 4: The gNB can select MBS UEs for QoE measurement either in a randomized way or only select UEs that experience poor MBS service experience.*

*Proposal 5: Based on SA5 reply LS, RAN2 can confirm the agreement that AS layer should discard the QoE data if the AS layer buffer is full.*

*Proposal 6: If the AS layer QoE buffer is full, the UE can overwrite the old QoE data when it receives a new QoE report from the application layer. This principle can be predefined in the specification.*

*Proposal 7: When UE moves to RRC idle/inactive, the UE should perform the area scope check based on the area scope information provided in Application layer.*

*Proposal 8: RAN2 to further discuss whether the area scope check can be done in UE’s application layer, with the restriction that the checking can only be triggered at the start of a QoE session.*

*Proposal 9: When UE’s QoE buffer is full, the UE is allowed to trigger RRC Resume or Setup to report the QoE data if it is allowed by network.*

* Focus on P7-8

**Online (2nd week Tuesday) – AS layer buffer size (2)**

[R2-2303677](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303677.zip) QoE measurements in RRC\_INACTIVE and RRC\_IDLE Ericsson discussion Rel-18 NR\_QoE\_enh-Core

*Observation 1 Agreeing on the memory size for storing of QoE reports at the end of the WI when the UE capabilities are discussed may be too late in case another option needs to be considered.*

*Observation 2 The AS layer would need to inform the application of RRC state changes or at least changes between connected and non-connected state if the LocationFilter would be used for area handling.*

*Observation 3 The LocationFilter would need to be updated to include also TA and PLMN if the LocationFilter would be used for area handling.*

*Observation 4 The AS layer would need to inform the application of cell changes if the LocationFilter is used for area handling.*

*Observation 5 The application may need to inform the UE AS that it needs to subscribe to changes of RRC state and changes of cell, tracking area or PLMN.*

*Observation 6 Any type of configuration related to the area handling would need to be sent to the application if the LocationFilter would be used for area handling.*

*Observation 7 If the application would handle the area by means of the LocationFilter, every application would need to implement the area handling.*

*Observation 8 If the UE AS would handle the area, it has already all the necessary information and all the additional impacts listed above would not be needed.*

*Observation 9 No benefits can be identified by allowing the application to handle the area.*

*Proposal 1 Provide a QoE configuration for RRC INACTIVE/IDLE states within the RRCRelease message.*

*Proposal 2 Increase the UE AS memory to at least 512 kB to accommodate larger amounts of buffered QoE reports in the RRC\_INACTIVE/RRC\_IDLE states*

*Proposal 3 Another option, when the UE AS memory becomes full while it is in RRC\_INACTIVE or RRC\_IDLE state, could be for the UE to store the buffered QoE reports in the UE application layer.*

*Proposal 4 Upon reconnecting to the RRC\_CONNECTED state, a UE could indicate to the network the total size of the QoE reports buffered while a UE was in a non-RRC\_CONNECTED state.*

*Proposal 5 UE should check whether the target gNB is within the PLMN identity list upon reconnecting from RRC\_IDLE to RRC\_CONNECTED.*

*Proposal 6 The UE AS layer is responsible for the area handling when a UE is in RRC\_IDLE or RRC\_INACTIVE.*

* Focus on P2-4

[R2-2302886](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302886.zip) Discussion on support of QoE measurements in RRC\_IDLE and RRC\_INACTIVE Lenovo discussion Rel-18 NR\_QoE\_enh-Core

*Proposal 1: The gNB uses the MBSInterestIndication message to determine and select qualified UEs for MBS broadcast QoE measurements.*

*Proposal 2: The UE keeps and continues the MBS broadcast QoE configurations in RRC\_IDLE or RRC\_INACTIVE which have not been explicitly released by the gNB per RRCRelease message.*

*Proposal 3: Support the option to send MBS broadcast QoE measurements which are collected in RRC\_INACTIVE during SDT procedure.*

*Proposal 4: Start discussion on the factors to consider for selecting the minimum AS layer buffer size for storing MBS broadcast QoE measurements in RRC\_IDLE/RRC\_INACTIVE.*

*Proposal 5: Agree on 64 kBytes as minimum value if no consensus can be reached on the factors to consider for selecting the minimum AS layer buffer size.*

* Focus on P4-5

[R2-2303532](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303532.zip) Consideration on QoE measurement in RRC\_IDLE and RRC\_INACTIVE CMCC discussion Rel-18 NR\_QoE\_enh-Core

[R2-2303780](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303780.zip) Considerations on QoE measurements in RRC\_IDLE and RRC\_INACTICE China Telecom discussion

[R2-2304086](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304086.zip) Discussion on QoE measurements in RRC\_IDLE and INACTIVE states China Unicom discussion NR\_QoE\_enh-Core

[R2-2303319](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303319.zip) Discussion on QoE measurement in RRC\_IDLE and RRC\_INACTIVE Samsung discussion Rel-18

[R2-2303108](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303108.zip) Discussion on QoE measurement in IDLE and INACTIVE ZTE Corporation, Sanechips discussion Rel-18 NR\_QoE\_enh-Core

[R2-2303510](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303510.zip) QoE collection for IDLE and Inactive state Qualcomm Incorporated discussion NR\_SL\_relay\_enh-Core

[R2-2304037](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304037.zip) Discussion on QoE measurements in RRC IDLE and INACTIVE state CATT discussion Rel-18 NR\_QoE\_enh-Core

### 7.14.3 Rel-17 leftover topics for QoE

Including discussion on Rel-17 leftover topics as agreed in previous meetings.

This agenda item will not be treated in this meeting (except for LSs received from other WGs).

### 7.14.4 Support of QoE measurements for NR-DC

Including discussion on the new SRB (“SRB5”) configuration and procedure details (e.g. leg change, RRC configuration, QoE reporting aspects, etc.).

Including discussion on how to achieve splitting of QoE configuration identities between MN and SN.

Including discussion on different m-based QoE configurations for MN/SN (pending RAN3 decisions).

**AT-meeting offline discussions (started at meeting start)**

* [AT121bis-e][220][QoE] SRB5 configuration and usage (China Unicom)

Scope: Discuss how the SRB5 is configured by MN/SN, e.g. how switching the reporting leg and QoE pause work. Attempt to provide proposal on agreeable details as well as details requiring further discussion.

Intended outcome: Discussion report in [R2-2304395](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304395.zip)

Deadline: Deadline 2

**Online (2nd week Tuesday) – Report of [220] (1)**

[R2-2304395](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304395.zip) Report of [AT121bis-e][220][QoE] SRB5 configuration and usage (China Unicom) China Unicom discussion Rel-18 NR\_QoE\_enh-Core

*[Easy agreements]*

*(12/12) Proposal 1: Both SRB4 and SRB5 can be configured simultaneously.*

*(12/12)Proposal 7: SRB5 handling (setup, modification, release) is configured via SN RRC Reconfiguration message, and SRB5 should be released when the SCG is released.*

*(12/12)Proposal 8: According to the RAN2/RAN3 agreements, TS 37.340 can be updated based on the introduction of SRB5.*

*(10/12)Proposal 10: If SRB5 is configured, the SCG is not deactivated, UE can transmit the QoE reports related to SCG in MeasurementReportAppLayer message via SRB5.*

*(12/12)Proposal 11: RAN2 to agree the following RRC spec impacts with SRB5 introduced:*

*1) SRB5 is for RRC messages which include application layer measurement report information (i.e. MeasurementReportAppLayer), all using DCCH logical channel.*

*2) SRB5 has a lower priority than SRB3 and can only be configured by the network after AS security activation.*

*3) Once AS security is activated, all RRC messages on SRB5 are integrity protected and ciphered by PDCP.*

*4) Split SRB is not supported for SRB5.*

*5) The integrity protection algorithm is common for SRB1, SRB2, SRB3 (if configured), SRB4 (if configured), SRB5 (if configured) and DRBs configured with integrity protection, with the same keyToUse value. The ciphering algorithm is common for SRB1, SRB2, SRB3 (if configured), SRB4 (if configured), SRB5 (if configured) and DRBs configured with the same keyToUse value.*

*6) SRB5 release is supported, e.g. via srb5-ToRelease IE*

*(11/12)Proposal 13: SRB5 can be used for transfer of segments of ULDedicatedMessageSegment.*

*(12/12)Proposal 14: As a baseline, Rel-17 pause/resume procedure is reused to pause/resume reporting of one or multiple QoE measurement configurations in a UE for NR-DC. Details are FFS, e.g. whether paused QoE reports can be reported to SN (if SN is not overload).*

Bulk agreements

* 1: Both SRB4 and SRB5 can be configured simultaneously.
* 7: SRB5 handling (setup, modification, release) is configured via SN RRC Reconfiguration message, and SRB5 should be released when the SCG is released.
* 8: According to the RAN2/RAN3 agreements, TS 37.340 can be updated based on the introduction of SRB5.
* 10: If SRB5 is configured, the SCG is not deactivated, UE can transmit the QoE reports related to SCG in MeasurementReportAppLayer message via SRB5.
* 11: RAN2 to agree the following RRC spec impacts with SRB5 introduced:

1) SRB5 is for RRC messages which include application layer measurement report information (i.e. MeasurementReportAppLayer), all using DCCH logical channel.

2) SRB5 has a lower priority than SRB3 and can only be configured by the network after AS security activation.

3) Once AS security is activated, all RRC messages on SRB5 are integrity protected and ciphered by PDCP.

4) Split SRB is not supported for SRB5.

5) The integrity protection algorithm is common for SRB1, SRB2, SRB3 (if configured), SRB4 (if configured), SRB5 (if configured) and DRBs configured with integrity protection, with the same keyToUse value. The ciphering algorithm is common for SRB1, SRB2, SRB3 (if configured), SRB4 (if configured), SRB5 (if configured) and DRBs configured with the same keyToUse value.

6) SRB5 release is supported, e.g. via srb5-ToRelease IE

* 13: UL segmentation can be used for message over SRB5.
* 14: As a baseline, Rel-17 pause/resume procedure is reused to pause/resume reporting of one or multiple QoE measurement configurations in a UE for NR-DC. Details are FFS, e.g. whether paused QoE reports can be reported to SN (if SN is not overload).

- QC wonders about P13: Wonders if the wording is good?

*[Online discussion]*

* 2: The network can optionally explicitly indicate the SRB for the QoE reporting if both SRB4 and SRB5 are configured. FFS on the granularity, e.g. per QoE config or otherwise.

- Ericsson thinks we could report the “(to MN or SN)”. QC thinks we can just indicate which SRB is used. Ericsson points out encapsulated reporting also has to be handled.

- LGE wonders if this indication is mandatory or optional? in normal cases it’s not natural to report MCG configuration to SCG or vice versa.

*(9/12)Proposal 3: QoE reports can be reported to MN directly if SRB4 is configured and SRB5 is not configured to the UE. QoE reports can be reported to SN directly if SRB5 is configured and SRB4 is not configured to the UE. FFS whether network configuration is needed.*

- QC wonders about the FFS: What does the network configuration mean? If UE has only one SRB, what is configured? Huawei agrees and thinks we can have implicit configuration in this case. Ericsson thinks the FFS is for the multi-vendor scenario.

- Charter thinks this comes from P2 already. China Unicom thinks these are different aspects: P3 handles the case when only one SRB is used, whereas P2 has two SRBs.

- LGE thinks the intent of the first sentence is about MN-associated QoE and second is about SN-associated. China Unicom thinks this is not the case and either can be used.

* 3: MN- or SN-associated QoE reports can use either SRB4 or SRB5 if only one of SRB4 or SRB5 is configured for the UE. FFS whether network configuration is needed.

*(8/12)Proposal 5: An ongoing application layer measurement session in APP layer is not affected when the reporting leg is changing. The reporting leg can also be changed even if the application session (from AS layer point of view) is ongoing.*

- Ericsson thinks the second part means the leg change can be also during ongoing session.

- Vodafone wonders what this proposal means: AS doesn’t anyway tell about the SRB change to AL. QC thinks the point is that used bearer is transparent to AL. This would apply to all bearers.

* 5: There is no feedback from AS to AL in case reporting SRB is changed. This means that an ongoing application layer measurement session in APP layer is not affected when the reporting SRB is changed. The reporting SRB can also be changed even if the application session (from AS layer point of view) is ongoing.

*(8/12) Proposal 9: For NR-DC, if SRB5 is not configured (FFS on the SCG deactivation case), UE can transmit the encapsulated QoE reports related to SCG via SRB4 to the MN. FFS on the UL RRC message.*

* 9: For NR-DC, if SRB5 is not configured (FFS on the SCG deactivation case), UE can transmit the SN-associated QoE reports via SRB4. FFS whether there are some ambiguities how MN knows where to forward this.

- Ericsson thinks the encapsulated case is different than P3. Samsung clarifies RAN3 agreed that when node has configured QoE but other node receives the reports, they are just forwarded directly.

- Nokia wonders what SN-associated means? Thinks this is container from AL, so UE may not know that. Lenovo thinks the report IDs are separate for MN and SN, so MN knows from that whether it needs to forward the message to SN. Ericsson thinks MN already knows that if it’s in ULInformationTransferMRDC, it’s transparent forwarding. QC thinks that is only for m-based QoE. But how does UE know this?

*(8/12)Proposal 12: FFS on whether the UE resumes SRB5 (if configured) during RRC connection resume.*

*(11/12)Proposal 18: FFS on whether RVQoE reports and encapsulated QoE reports are reported together to the same node (MN or SN) in NR-DC.*

* 12: The UE resumes SRB5 (if configured) during RRC connection resume based on network indication (same as for SCG bearers in general).
* 18: FFS pending RAN3 decisions: Whether RVQoE reports and encapsulated QoE reports are reported together to the same node (MN or SN) in NR-DC.

- China Unicom thinks most companies agreed to these. Ericsson thinks P12 needs network indication. QC thinks this is not the same as SRB4 but rather SCG bearer.

*[FFS]*

*(7/12)Proposal 4: For leg switching in NR-DC scenario, FFS on the explicit indication and implicit indication, e.g. signaling impacts, details on UE/NW behaviours.*

*(8/12)Proposal 6: RAN2 can wait for more RAN3 progress on the alignment of MDT and QoE before discussing any issues.*

*(5/12)Proposal 15: RAN2 can wait for RAN3 to decide which SRB (SRB1/SRB3/Split SRB1) can be used to configure SN-related RVQoE configuration.*

*Proposal 16: RAN2 can follow RAN3’ decision, and discuss whether the first blindly configured or the non-first configured RVQoE configuration can be generated by the same node which generates the configuration for container based QoE.*

*Proposal 17: RAN2 can wait for RAN3 progress and then discuss whether the other node can send the RRC message to update/modify the RAN visible QoE configuration which was not configured by this node.*

* 4: For SRB switching in NR-DC scenario, FFS on the explicit indication and implicit indication, e.g. signaling impacts, details on UE/NW behaviours.
* 6: RAN2 can wait for more RAN3 progress on the alignment of MDT and QoE before discussing any issues.

**Online (2nd week Tuesday) – QoE in NR-DC (if not handled by email discussion)**

[R2-2303511](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303511.zip) RAN2 issues to support QoE collection in NR-DC Qualcomm Incorporated discussion NR\_QoE\_enh-Core

*Container based QoE reporting in NR-DC operation*

*Observation 1: There is no bearer mapping on UE side for QoE data reporting.*

*Observation 2: There is no different QoS requirements for QoE data, then no different bearers needed for QoE reporting.*

*Observation 3: In Rel-17, RVQoE is configured to the UE only when the corresponding container-based QoE is provided to the UE and share the same RRC ID as corresponding container-based QoE.*

*Proposal 1: For container based QoE reporting, only one bearer, i.e. either SRB4 or SRB5 is configured at a given time for QoE reporting in NR-DC operation.*

*Proposal 2: QoE reporting leg change can be achieved by existing bearer type change, and then no explicit leg indication needed.*

*Proposal 3: RVQoE configuration should be generated by the RAN node which has the knowledge of the corresponding container QoE, and can be configured using SRB1 or SRB3 to the UE.*

*For RVQoE collection in NR-DC operation*

*Observation 4: RVQoE measurement should be sent to the RAN node which provide(s) bearers carrying the application collecting the RVQoE report(s).*

*Proposal 4: The receiving RAN node will determine the appropriate RAN node the RVQoE measurement should be sent based on the received QoS flow ID(s) and then forward to the appropriate RAN node if needed.*

*Proposal 5: Only one bearer is configured for RVQoE reporting and the bearer is same as the bearer configured for container-based QoE reporting.*

* Focus on P3-5

By Email [220] (10)

[R2-2302951](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302951.zip) Discussion on SRB5 configuration and procedure NEC discussion Rel-18 NR\_QoE\_enh-Core

[R2-2303109](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303109.zip) Discussion on QoE measurement for NR-DC ZTE Corporation, Sanechips discussion Rel-18 NR\_QoE\_enh-Core

[R2-2303309](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303309.zip) Support of QoE measurements for NR-DC LG Electronics Inc. discussion Rel-18

[R2-2303320](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303320.zip) Discussion on switching reporting leg in NR-DC Samsung discussion Rel-18

[R2-2303364](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303364.zip) Views on QoE Reporting for NR-DC Apple discussion Rel-18 NR\_QoE\_enh-Core

[R2-2303598](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303598.zip) Discussion on QoE measurements in NR-DC Huawei, HiSilicon discussion Rel-18 NR\_QoE\_enh-Core

[R2-2303643](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303643.zip) QoE configuration and reporting in NR-DC Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_QoE\_enh-Core

[R2-2303678](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303678.zip) QoE measurements in NR-DC Ericsson discussion Rel-18 NR\_QoE\_enh-Core

[R2-2304038](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304038.zip) Discussion on support of QoE measurement for NR-DC CATT discussion Rel-18 NR\_QoE\_enh-Core

[R2-2304085](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304085.zip) Discussion on QoE configuration and reporting for NR-DC China Unicom discussion NR\_QoE\_enh-Core

### 7.14.5 Other topics

Including discussion on the continuity of legacy QoE measurement job for streaming and MTSI service during intra-5GC inter-RAT handover process.

Including any other QoE enhancement discussion (e.g. service type aspects).

This agenda item will not be treated in this meeting (except for LSs received from other WGs).

## 7.17 Dual Transmission/Reception (Tx/Rx) Multi-SIM for NR

(NR\_DualTxRx\_MUSIM-Core; leading WG: RAN2; REL-18; WID: [RP-230751](https://www.3gpp.org/ftp/TSG_RAN/TSG_RAN/TSGR_99/Docs/RP-230751.zip))

Time budget: 0.5 TU

Tdoc Limitation: 3 tdocs

### 7.17.1 Organizational

Including LSs and any rapporteur inputs (e.g. work plan)

**Online (1st week Tuesday) – LS from RAN4 (1)**

[R2-2302430](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302430.zip) LS on priority for MUSIM gaps (R4-2303249; contact: vivo) RAN4 LS in Rel-18 NR\_DualTxRx\_MUSIM-Core To:RAN2

*RAN4 has discussed and achieved the following agreements on priority for MUSIM gaps:*

*• Introduction of priorities for periodic MUSIM gaps*

*o Each periodic MUSIM gap can be assigned with a different priority*

*o The priority level of MUSIM gap(s) shall be configured to be comparable to priority level of NW A’s Type-2 MGs*

*- MUSIM gap and Type-2 MG cannot be configured with the same priority*

*o The priority level of MUSIM gaps should be configured/allocated by NW A*

*RAN4 further agrees that:*

*• When requesting periodic MUSIM gap(s) UE can provide an assistance information for gap priority selection*

*o UE can optionally indicate its preferred priority for all or a subset MUSIM gaps*

*o It is up to NW A on how to use this information*

*Definition of Type-2 MG: Gap(s) configured via GapConfig-r17 without preConfigInd-r17 or ncsgInd-r17*

*RAN4 is still discussing whether priority for aperiodic MUSIM gap needs to be introduced.*

*RAN4 respectfully asks RAN2 to take the above information into account and design corresponding signaling in their future work.*

- QC thinks in Rel-17 other gaps can have a priority. So we might need to address that somehow. Samsung thinks RAN4 decided not to introduce the priority for Rel-17

* RAN2 will aim to address the RAN4 LS in Rel-18 signalling. Should discuss how to handle Rel-17 gaps without priority (e.g. lowest, highest, network-decided somehow, etc.). Handled in email [231]

**Online (2nd week Tuesday) – running CRs (1)**

[R2-2303266](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303266.zip) MUSIM Stage 2 running CR vivo discussion Rel-18

* Endorsed (already in last meeting, just for information)
* Running CR rapporteurs (proposed by WI rapporteur).

38331 (except UE capabilities): vivo

38300: China telecom

37340: ZTE

38306+38331 (UE capabilities, same as in Rel-17): Huawei

38321: Samsung (if needed)

Post-meeting email discussions (Rel-18 MUSIM – started after RAN2#122, lasting until RAN2#123)

* [Post122][232][MUSIM] Running 38.300 CR for NR MUSIM enhancements (China Telecom)

Scope: Update running Stage-2 CR based on agreements in this meeting for NR Rel-18 MUSIM

Intended outcome: Endorsed running CR

Deadline: Long (until RAN2#123, started after RAN2#122)

* [Post122][233][MUSIM] Running RRC CR for NR MUSIM enhancements (vivo)

Scope: Update running RRC CR based on agreements in this meeting for NR Rel-18 MUSIM

Intended outcome: Endorsed running CR

Deadline: Long (until RAN2#123, started after RAN2#122)

### 7.17.2 Procedures for MUSIM temporary capability restriction

Including discussion on UE procedures when UE is in IDLE/INACTIVE towards NW A, e.g. how to handle UE moving to CONNECTED in NW A while already being CONNECTED in NW B: Does UE indicate something in RRC setup/resume request towards NW A or NW B?

Including discussion on UE procedures when UE is in CONNECTED towards NW A, e.g. how to handle UE moving to CONNECTED in NW B

Including discussion on how UE indicates it is using temporary UE capabilities at connection setup/resume

**Online (2nd week Tuesday) – reactive/proactive mechanisms (1)**

[R2-2302781](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302781.zip) Further considerations on the capability restriction request for Rel-18 MUSIM Intel Corporation discussion Rel-18 NR\_DualTxRx\_MUSIM-Core

*Observation#1: Other than Scenario 1, the following scenarios 2 and 3 need to be studied:*

*Scenario 2: UE in NW A and NW B in RRC\_Connected indicates its preference on temporary UE capability due to reconfiguration in NW B*

*Scenario 3: Only one network supports Rel-18 MUSIM (e.g. NW B is in LTE or NW B does not support Rel-18 MUSIM)*

*Observation#2: Reactive approach may result in delay in establishing/resuming connection to network A as in sub-scenarios 1A and 1B.*

*Observation#3: Reactive approach may result in delay in reconfiguration as in sub-scenario 2A if it needs to inform capability restriction to the other network*

*Observation#4: For sub-scenario 3A, UE may be configured in network A during connection resumption with configuration (e.g. SCell and/or SCG) that is incompatible to its configuration with network B.*

*Observation#5: For sub-scenario 3B, UE can only reject the configuration from NW A as the configuration cannot be restricted in NW B.*

*Observation#6: If the capability restriction due to resource usage from one network is proactively provided by the UE to the other network(s), reconfiguration delay or rejection can be avoided.*

*Observation#7: One main issue with UE proactively provides the UE assistance to NW A is that it may result in unnecessary signalling overhead to NW A, particularly if this capability restrictions indicated by UE are not going to be configured (now or in the future) by NW A.*

*Observation#8: During resumption (ResumeRequest), network A needs to be informed of possible capability restriction to avoid the network A configuring resources in Resume message incompatible to the configuration in network B.*

*Observation#9: Supporting and configuring Rel-17 and Rel-18 MUSIM features simultaneously for a UE can lead to more optimal performance by using the most appropriate solution depending on the scenario and the UE state.*

*Proposal#1: UE is allowed to proactively provide capability restriction request to the other network(s).*

*Proposal#2: RAN2 to discuss how to reduce the unnecessary signalling overhead due to possible proactive sending capability restriction request/indication, e.g. indicating the bands of concern to the UE in the UAI configuration for Rel-18 MUSIM.*

*Proposal#3: UE should indicate release/incapability of CA/DC during connection resume to the network so that the network knows that there is possible restriction on the UE capabilities and the network and UE should not use CA/DC. Network should wait until the UE provides the UE capability restriction before reconfiguring the UE further with higher capability configuration (e.g. CA, SCG and/or MIMO layers, larger BW etc.).*

*Proposal#4: It should be possible to configure both Rel-17 and Rel-18 MUSIM features (if supported) simultaneously for a UE.*

*Proposal#5: Postpone the discussion on whether UE supporting Rel-18 MUSIM also needs to support of Rel-17 MUSIM UE capabilities till Rel-18 MUSIM operation is defined.*

* Focus on P1-3

- Qualcomm thinks we also had early indication proposals. Is this different from that? Is it UAI or something else? Intel clarifies this can be both. QC wonders how UE can indicate if NW doesn’t allow UAI? Intel thinks this could be UAI for CCs that are not yet configured. ZTE clarifies we have some exceptions for SDT.

- Huawei thinks it’s not clear what proactive and reactive solutions are. Are all updated capabilities compatible with NW A or B configurations for proactive? Can we really do that? Intel clarifies that UE can report the information to NW A even if NW A has not configured it for UE in NW A. Similar could apply for all capabilities, e.g. even for MIMO layers.

- Nokia thinks we agreed that proactive signalling is under NW control – is this trying to override that? Intel thinks we can discuss that and UE can indicate the “bands of concern” to NW. Would be still in NW control.

- Apple thinks the proactive approach is about providing information before it is used. Wonders how this works compared to reactive approach? Intel thinks this helps if NW B doesn’t support MUSIM.

- Ericsson thinks we will need a mixture of reactive and proactive approaches. Need to consider some signalling enhancements for early indications to setup/resume procedures. This could avoid reconfiguration failures. Samsung agrees. ZTE and vivo also supports the Intel proposal.

- Huawei thinks we anyway need reactive. Samsung thinks in some cases the proactive approach could be even mandatory, e.g. blind HO.

- Vodafone thinks the approaches could be completely different.

* Consider “proactive” approach (wherein the UE can request capability restrictions which can be independent of current RRC configuration if allowed by the NW) to MUSIM capability restrictions in addition to the reactive approach (which has been agreed previously). Such a mechanism shall still be under NW control, i.e. it is up to network whether to allow such signalling. FFS on the details – should aim for a common framework for the reactive and proactive approach. FFS on UE capabilities

[R2-2303639](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303639.zip) Overall Dual-RX/TX MUSIM procedure Ericsson discussion Rel-18 NR\_DualTxRx\_MUSIM-Core

*Observation 1 The UE needs to free hardware resources with NW-1 (and ensure that NW-1 does not try to use those resources later) to allocate one transceiver to NW-2.*

*Observation 2 By restricting the usage of the frequencies in NW-1 and NW-2, any IDC issue due to MUSIM is also resolved.*

*Observation 3 The same procedure is valid regardless of if the UE is in RRC\_CONNECTED with NW-1 and RRC\_IDLE/INACTIVE in NW-2, or vice versa.*

*Based on the discussion in the previous sections we propose the following:*

*Proposal 1 The UE restricts in NW-1 all the frequencies handled by the second transceiver, to prevent NW-1 to use it and to free the hardware resources for the other NW.*

*Proposal 2 UE uses a flag in RRCSetupComplete/RRCResumeComplete to indicate to NW-2 that its capabilities are temporarily restricted.*

*Proposal 3 NW-2 configures the UE with a “minimal” configuration in the first RRCReconfiguration message.*

*Proposal 4 NW-2 configures the UE to report the capability restrictions via UEAssistanceInformation message and indicates all the frequencies NW-2 intends to use.*

*Proposal 5 The UE restricts the affected frequencies in NW-2 and, if needed, updates the list of restricted frequencies in NW-1, to prevent one network from configuring the UE with hardware resources that UE is using with the other network.*

*Proposal 6 NW-2 reconfigures, if needed, the UE with a proper configuration, once the restricted capabilities are received via UEAssistanceInformation message.*

*Proposal 7 Only SCell/SCG release should be supported for dual-active MUSIM purpose.*

*Proposal 8 A prohibit timer is needed to allow the network to react to the UE indication of restricted capabilities and reconfigure to UE. At timer expiration, the UE can e.g., either request to leave NW-1 (using Rel-17 MUSIM leave indication), or not respond to the Paging message in NW-2.*

Focus on P2

*Proposal 2 UE uses a flag in RRCSetupComplete/RRCResumeComplete to indicate to NW-2 that its capabilities are temporarily restricted.*

- LGE has concern on using Msg5 for the restriction since it’s too late. Network could already start using CA/DC in resume. Would like to use UAI principle for this e.g. similar to SDT.

- Intel supports using early indication. QC thinks this is a problem already after Msg5 in the field. So sending something in Msg5 could still be helpful.

- Apple Support sending some kind of early indication. Considering message size restriction, we prefer it to be a 1-bit indication. ZTE, MTK also supports.

- Huawei supports but thinks resume is more important than setup. Thinks more details are still needed in UAI.

- Intel thinks ResumeComplete might still be too late.

* Support “early indication” from UE to network during RRC connection setup/resume procedure.
* FFS how to indicate this and in which message. The indication will tell network that UE capabilities are temporarily restricted.
* FFS on details (i.e. when UE can indicate this, what does it indicate, how does it relate to UAI, etc.)

**Online (2nd week Tuesday) – UE-initiated SCell/SCG (de)activation for MUSIM (1)**

[R2-2303455](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303455.zip) Further discussion on the UE-initiated SCell/SCG deactivation and activation for MUSIM Huawei, HiSilicon, Vodafone, Vivo discussion Rel-18

*(moved from 7.17.3)*

*Proposal 1: If allowed by the NW, the UE can request SCell/SCG deactivation (and reversal) using RRC signaling (e.g. UAI) for MUSIM purpose.*

*Proposal 2: The NW can configure gap-based RRM measurement for the deactivated SCell/SCG for mobility purpose. If not configured, the UE is allowed to NOT perform RRM/RLM/BFD on the deactivated SCell/SCG.*

- QC thinks the problem with deactivation is the measurements. Wonders if NW A will configure gaps for SCell in NW A so UE can use the NW A resources for measurements? Thinks we should use UAI and no MAC signalling. Huawei clarifies they don’t consider MAC CE anymore. Thinks there is no need to introduce new RRC requirements in RAN4. Vodafone agrees and thinks this just mean some requirements don’t apply. vivo is fine to restrict to UAI.

- Apple thinks we shouldn’t complicate the solution more. MTK and LGE support P1.

- Nokia thinks UE may still need to reserve resources for deactivated Scell. That needs to be confirmed and may require some UE capabilities. Huawei wonders which resources are maintained by UE – is it memory or something else? Nokia clarifies that if UE is capable of 4 SCells, having one deactivated may not help since the total number of cells matters. Huawei thinks this is more of a memory issue. Nokia thinks this is about capability exceeding.

- Vodafone thinks SCell release penalizes NW A. Ericsson wonders if we need more than one solution.

Show of hands

Support UE-initiated SCell deactivation for MUSIM: 6 (HW, MTK, Vodafone, LGE , China Telecom, vivo)

Do not support UE-initiated SCell deactivation for MUSIM: 6 (Ericsson, Apple, Nokia, DENSO, Samsung, Intel)

* No consensus to support UE-initiated SCell deactivation for MUSIM in Rel-18.

[R2-2303779](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303779.zip) Support of UE requesting SCell/SCG Deactivation for eMUSIM Sharp discussion

*(moved from 7.17.3)*

*Proposal 1: If configured by the network, UE can request SCell/SCG deactivation (and reversal) for MUSIM purpose.*

*Proposal 2: It up to the UE implementation to request release or deactivate of SCell/SCG for MUSIM purpose.*

[R2-2302550](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302550.zip) Procedures for MUSIM temporary capability restriction OPPO discussion Rel-18 NR\_DualTxRx\_MUSIM-Core

[R2-2302721](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302721.zip) UE Capability restrictions for Dual-Active MUSIM Qualcomm Incorporated discussion

[R2-2302725](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302725.zip) Consideration on capability restriction for dual Rx/Tx MUSIM DENSO CORPORATION discussion NR\_DualTxRx\_MUSIM-Core

[R2-2303188](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303188.zip) Baseline signalling procedure options for temporary capability restrictions. Nokia, Nokia Shanghai Bell discussion

[R2-2303225](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303225.zip) Procedure of dual Tx/Rx Multi-SIM Lenovo discussion Rel-18

[R2-2303267](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303267.zip) Procedures for MUSIM temporary capability restriction vivo discussion Rel-18

[R2-2303409](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303409.zip) Procedures for MUSIM temporary capability restriction Apple discussion Rel-18 NR\_DualTxRx\_MUSIM-Core

[R2-2303669](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303669.zip) Procedures for MUSIM temporary capability restriction Samsung R&D Institute India discussion

[R2-2303774](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303774.zip) Procedure of UE Capability Restriction for eMUSIM Sharp discussion

[R2-2303874](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303874.zip) Temporary Capability Restriction for Idle/Inactive State Transfer ZTE Corporation, Sanechips discussion Rel-18 NR\_DualTxRx\_MUSIM-Core

[R2-2304026](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304026.zip) Procedures for MUSIM Temporary Capa Restriction LG Electronics discussion Rel-18 NR\_DualTxRx\_MUSIM-Core

### 7.17.3 Allowed MUSIM temporary capability restrictions

Including discussion on which UE capabilities can be impacted by temporary UE capability restrictions and how signalling of temporary UE capability changes works (e.g. for band combination restrictions due to band conflict), what is the granularity of temporary UE capability restrictions, and what does UE report to the network?

**AT-meeting offline discussions (started at meeting start)**

* [AT121bis-e][230][MUSIM] UE capability restrictions (vivo)

Scope: Discuss and attempt to converge on the set of UE capabilities allowed to be temporarily restricted for MUSIM.

Intended outcome: Discussion report in [R2-2304397](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304397.zip)

Deadline: Deadline 2

**Online (2nd week Wednesday) – Report of [230] (1)**

[R2-2304397](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304397.zip) Report of [AT121bis-e][230][MUSIM] UE capability restrictions (vivo) vivo discussion Rel-18 NR\_DualTxRx\_MUSIM-Core

Proposed agreements by email [230]

*Easy agreements:*

* 1: For Rel-18 MUSIM dual active operation, the maximum MIMO layer may be changed and the change can be indicated to the NW. FFS if this is only for NW A or also NW B.
* 3: For Rel-18 MUSIM dual active operation, the measurement gap requirement may be changed and the change can be indicated to the NW. FFS if this is only for NW A or also NW B.
* 4: For Rel-18 MUSIM dual active operation, the measurement gap requirement change is reported for each serving cells, and for target bands or all supported NR bands depending on whether target bands are configured by the NW. FFS on whether the reporting can reuse the current *needForGapInfoNR* in RRC reconfiguration complete or extend the similar function in UAI. FFS if this is only for NW A or also NW B.
* 8: The maximum UL power may be changed due to Rel-18 MUSIM dual active operation, but there is no need to introduce any new UE behavior for reporting this change.

*To discuss: P6*

* 6: UE can explicitly request specific serving cells or serving cell group to be released for Rel-18 MUSIM purpose. FFS how/whether this works for the proactive case.

- Intel thinks that since we agreed to proactive mechanism, should extend this to non-serving cells. vivo clarifies that most companies agreed it’s beneficial to indicate specific serving cell.

- Samsung wonders if we need this for proactive.

*To discuss: P9*

*P9: Original rapporteur proposal:*

?? 9: RAN2 should try to avoid duplicating all the capabilities in the UAI for MUSIM purpose. [10/13].

*Wording proposal from Huawei to P9 via [230]:*

* 9: RAN2 should avoid duplicating all the capabilities that UE reports via the *UECapabilityInformation* in the UAI for R18 MUSIM purpose.

*To discuss: P2, P5, P7*

*Proposal 2: RAN2 to discuss whether option 1 (per direction, per FR, with the same maximum MIMO layer for each serving cell) granularity is sufficient for the UE to report its maximum MIMO layers to the NW A. [8/14]*

*Proposal 5: RAN2 to further discuss that whether SRS switching capability maybe changed and the change can be indicated to the NW A for Rel-18 MUSIM purpose. [6/15]*

*Proposal 7: RAN2 to continue study whether bandwidth capability maybe changed and the change should be indicated to the NW A for Rel-18 MUSIM purpose. [10/15]*

* RAN2 can discuss P2, P5 and P7 from [R2-2304397](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304397.zip) during RAN2#123.

By Email [230] (16)

[R2-2302551](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302551.zip) Allowed MUSIM temporary capability restrictions OPPO discussion Rel-18 NR\_DualTxRx\_MUSIM-Core

[R2-2302782](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302782.zip) Signalling to indicate temporary capability reduction for Rel-18 MUSIM Intel Corporation discussion Rel-18 NR\_DualTxRx\_MUSIM-Core

[R2-2302966](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302966.zip) Allowed MUSIM temporary capability restrictions Samsung R&D Institute India discussion Rel-18

[R2-2303189](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303189.zip) Adidtional aspects related to capability restriction signalling Nokia, Nokia Shanghai Bell discussion

[R2-2303268](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303268.zip) Discussion on temporary capability restriction for Rel-18 Multi-SIM vivo discussion Rel-18

[R2-2303350](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303350.zip) Capability sharing issue for SRS Tx switching capability Xiaomi discussion Rel-18 NR\_DualTxRx\_MUSIM-Core [R2-2301116](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2301116.zip)

[R2-2303351](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303351.zip) Remaining issues on band combination restrictions due to band conflict Xiaomi discussion Rel-18 NR\_DualTxRx\_MUSIM-Core [R2-2301117](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2301117.zip)

[R2-2303410](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303410.zip) Parameters for MUSIM temporary capability restriction Apple discussion Rel-18 NR\_DualTxRx\_MUSIM-Core

[R2-2303470](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303470.zip) Further discussion on MUSIM temporary capability restrictions Huawei, HiSilicon discussion Rel-18 NR\_DualTxRx\_MUSIM-Core

[R2-2303623](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303623.zip) Discussion on temporary UE capability restriction for MUSIM MediaTek Inc. discussion [R2-2300816](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2300816.zip)

[R2-2303624](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303624.zip) Disucssion on UE capability restriction signaling China Telecommunications discussion

[R2-2303640](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303640.zip) Discussion on restricted UE capabilities Ericsson discussion Rel-18 NR\_DualTxRx\_MUSIM-Core

[R2-2303873](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303873.zip) Consideration on the Temporary Capability Restriction ZTE Corporation, Sanechips discussion Rel-18 NR\_DualTxRx\_MUSIM-Core

[R2-2303938](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303938.zip) Discussion on temporary capability restriction for Dual Tx/Rx Multi-SIM ASUSTeK discussion Rel-18 NR\_DualTxRx\_MUSIM-Core

[R2-2304027](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304027.zip) Simple Methods for MUSIM Temporary Capa Restriction LG Electronics discussion Rel-18 NR\_DualTxRx\_MUSIM-Core

### 7.17.4 MUSIM gap priorities and other RAN4 impacts

Including discussion on RAN4 LS [R4-2303249](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_106/Docs/R4-2303249.zip) concerning Rel-17 MUSIM gap priorities

Including analysis on RAN4 impact on the maximum UL power change due to R18 MUSIM

**AT-meeting offline discussions (started after Tuesday maintenance session)**

* [AT121bis-e][231][MUSIM] RAN4 aspects of MUSIM (Samsung)

Scope: Discuss what to do in RAN2 for MUSIM gap priorities (based on RAN4 LS): Can UE indicate gap priority preference? Is the gap priority applicable to aperiodic gaps? What is the network behaviour (i.e. accept/reject/change priority)? Are there any RAN4 impacts on maximum UL power change?

Intended outcome: Discussion report in [R2-2304398](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304398.zip)

Deadline: Deadline 2

**Online (2nd week Tuesday) – Report of [231] (1)**

[R2-2304398](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304398.zip) Report of [AT121bis-e][231][MUSIM] RAN4 aspects of MUSIM (Samsung) Samsung discussion Rel-18 NR\_DualTxRx\_MUSIM-Core

*Proposals for easy agreements:*

*Proposal 1: Introduce 1 optional per-UE capability bit (without xDD/FRx differentation) to indicate MUSIM gap priority configuration and preference. A UE supporting this feature shall also support musim-GapPreference-r17.*

*Proposal 2: Introduce a new indication in the OtherConfig to indicate whether UE is allowed to report MUSIM gap priority preference via UAI.*

*Proposal 4: The existing IE GapPriority-r17 is re-used to configure the priority for periodic MUSIM gap.*

*Proposal 8: Wait RAN4 progress whether/how gap priority is applicable to aperiodic MUSIM gap.*

*Proposal 9: RAN2 assumes no RAN4 impact is expected on maximum UL power change due to R18 MUSIM. Can re-discuss if critical issues are found in RAN2.*

Bulk agreements

* 1: Introduce 1 optional per-UE capability bit (without xDD/FRx differentiation) to indicate MUSIM gap priority configuration and preference. A UE supporting this feature shall also support musim-GapPreference-r17.
* 2: Introduce a new indication in the OtherConfig to indicate whether UE is allowed to report MUSIM gap priority preference via UAI.
* 4: The existing IE GapPriority-r17 is re-used to configure the priority for periodic MUSIM gap.
* 9: RAN2 assumes no RAN4 impact is expected on maximum UL power change due to R18 MUSIM. Can re-discuss if critical issues are found in RAN2.

- For P8, Ericsson thinks network control is needed and RAN4 has been discussing the same things. Final decision on priority should be up to network. Should decide in RAN2 that aperiodic gap is also applicable for gap priority. Samsung understands the concern but majority thought we need to wait for RAN4. QC is fine if RAN2 thinks priority is needed. Apple is fine with aperiodic gap having priority but need to discuss those later on. Having low priority could make it cancelled, which is not useful.

- Huawei thinks RAN4 is still discussing this. ZTE thinks RAN4 is discussing this at the moment. Nokia thinks priority is needed and RAN4 is just discussing the handling of priority.

*Proposals needed to be discussed online:*

*Proposal 3: RAN2 to discuss how UE indicates periodic MUSIM gap priority preference*

*- Option 1: UE indicates an absolute priority for all or a subset periodic MUSIM gaps by taking into account of the Type-2 MG gap priority*

*- Option 2: UE indicates a relative priority for all or a subset periodic MUSIM gaps, i.e. the priority is relative just among the MUSIM gaps*

*- Option 3: wait RAN4 progress/feedback*

- Samsung clarifies that most companies were fine with option 1, but some companies thought we could wait for RAN4. Some companies have concern with option 1.

- Nokia thinks Option 1 is already indicated in RAN4 for configuration of priority. So better to consider for gap preference.

- MTK thinks configuration is option 1 but for preference could be option 2.

- QC thinks we just agreed to option 1. Doesn’t see advantage for option 2.

- Ericsson thinks network should be allowed to set any priority.

*Proposal 5: RAN2 to discuss how to configure the priority when network accepts gap priority preference for a periodic MUSIM gap*

*- Option A: Network configures the priority which is equal to the absolute value provided by the UE if Option 1 in Proposal 3 is agreed. FFS whether network can still change the absolute priorities while keeping the relative priorities among MUSIM gaps*

*- Option B: Network configures the priority which is aligned with the relative value provided by the UE.*

* No consensus on P3 and P5.

*Proposal 6: RAN2 to discuss whether to ask RAN4 on the same priority for periodic MUSIM gaps i.e. whether UE can report the same priority for different periodic MUSIM gaps and/or whether network can configure the same priority for different periodic MUSIM gaps.*

*Proposal 7: RAN2 to discuss whether the following question needs to be checked with RAN4*

*- Does network always configure priority levels to all configured periodic MUSIM gaps if UE is allowed to indicate periodic MUSIM gap priority preference? If not, is there any need to specify a default UE behavior?*

By Email [231] (12) – gap priorities and UL power change

[R2-2303641](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303641.zip) MUSIM gap priorities Ericsson discussion Rel-18 NR\_DualTxRx\_MUSIM-Core

*Proposal 1 The information element used to identify the priority of Rel-17 measurement gap configurations (GapPriority-r17) can be used to request and assign the MUSIM gaps priorities.*

*Proposal 2 Consider the Text Proposal in Annex A as a baseline for the MUSIM gap priority.*

*Proposal 3 A default priority value should be used for the MUSIM gaps which do not have an assigned priority. FFS if RAN2 or RAN4 to decide.*

*Proposal 4 RAN2 to discuss introduction of a new UE capability for support of MUSIM priority configuration.*

*Proposal 5 RAN2 to discuss if UE need to provide further information (e.g. MUSIM gap purpose) to assist the Network to configure the gap priorities (for MUSIM gaps and measurement gaps).*

[R2-2303828](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303828.zip) Discussion on MUSIM gap priorities and maximum UL power change Samsung Electronics Austria discussion Rel-18 NR\_DualTxRx\_MUSIM-Core

*MUSIM gap priorities:*

*Proposal 1: Gap priority can be configured per periodic MUSIM gap configuration by gapPriority-r17.*

*Proposal 2: Multiple periodic MUSIM gap patterns can be assigned with same or different gap priority.*

*Proposal 3: UE can optionally inform network A of its preferred gap priority for all or a subset of periodic MUSIM gaps via UEAssistanceInformation.*

*Proposal 4: It is up to network implementation whether/how to assign a gap priority to each requested MUSIM gap pattern.*

*Maximum UL power change:*

*Observation 1: With PHR reporting mechanism, it seems unlikely that R18 MUSIM UE 1) transmits its power larger than the existing specification allows and 2) is instructed to transmit its power that goes beyond its limit.*

*Observation 2: How to calculate maximum UL transmission power is defined in TS 38.101 series and RAN2 only specifies PHR MAC CE format and when to trigger PHR reporting.*

*Proposal 5: RAN2 assumes that there is no issue on the maximum UL power change due to R18 MUSIM. Can be revisited depending on progress in RAN4 work.*

[R2-2302724](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302724.zip) Remaining issues for MUSIM gaps Qualcomm Incorporated discussion

[R2-2302783](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302783.zip) Gap collision handling for Rel-17 gaps Intel Corporation discussion Rel-18 NR\_DualTxRx\_MUSIM-Core

[R2-2303190](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303190.zip) On MUSIM gap priority and uplink power sharing aspects of MUSIM operation Nokia, Nokia Shanghai Bell discussion

[R2-2303269](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303269.zip) Discussion on MUSIM gap priorities vivo discussion Rel-18

[R2-2303352](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303352.zip) Discussion on MUSIM gap priorities Xiaomi discussion Rel-18 NR\_DualTxRx\_MUSIM-Core

[R2-2303411](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303411.zip) Views on RAN4 LS for MUSIM gap priorities Apple discussion Rel-17 LTE\_NR\_MUSIM-Core

[R2-2303471](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303471.zip) Discussion on MUSIM gaps and other RAN4 topics Huawei, HiSilicon discussion Rel-18 NR\_DualTxRx\_MUSIM-Core

[R2-2303875](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303875.zip) Consideration on the Scheduling Gap Priority ZTE Corporation, Sanechips discussion Rel-18 NR\_DualTxRx\_MUSIM-Core

[R2-2303937](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303937.zip) Discussion on maximum UL power change for Dual Tx/Rx Multi-SIM ASUSTeK discussion Rel-18 NR\_DualTxRx\_MUSIM-Core

[R2-2304028](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304028.zip) MUSIM Gap Priority LG Electronics discussion Rel-18 NR\_DualTxRx\_MUSIM-Core

# Summary

**Comebacks: -**

**Agreed documents (0)**

*4.1: LTE legacy (0)*

None

**Endorsed (4)**

*7.5: Rel-18 XR enhancements (2)*

[R2-2302715](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302715.zip) Work Plan for Rel-18 WI on XR Enhancements for NR Nokia, Qualcomm (Rapporteurs) Work Plan Rel-18 NR\_XR\_enh-Core

[R2-2304393](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304393.zip) Stage 2 Overview of XR Enhancements Nokia, Qualcomm (Rapporteurs) draftCR Rel-18 38.300 17.4.0 B NR\_XR\_enh-Core

*7.14: Rel-18 QoE enhancements (1)*

[R2-2304084](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304084.zip) Revised Work Plan for Rel-18 NR QoE Enhancement China Unicom Work Plan NR\_QoE\_enh-Core

*7.17 Rel-18 Dual Rx/Tx MUSIM (1)*

[R2-2303266](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303266.zip) MUSIM Stage 2 running CR vivo discussion Rel-18

**Approved LS out (2)**

*7.5: Rel-18 XR enhancements (1)*

[R2-2304400](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304400.zip) LS on TSCAI for XR RAN2 LS out Rel-18 NR\_XR\_enh-Core To:SA2 Cc:RAN3

*7.14: Rel-18 QoE enhancements (1)*

[R2-2304401](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304401.zip) Reply LS on eQoE CRs for NR RAN2 LS out Rel-18 NR\_QoE\_enh-Core To: SA5 Cc:RAN3, SA4, CT1, CT4

**Post-meeting email discussions (short, CR/LS finalization) (0)**

None

**Post-meeting email discussions (very long) (2)**

* [Post122][232][MUSIM] Running Stage-2 CR for NR MUSIM enhancements (vivo)

Scope: Update running Stage-2 CR based on agreements in this meeting for NR Rel-18 MUSIM

Intended outcome: Endorsed running CR

Deadline: Very long (until RAN2#123, started after RAN2#122)

* [Post122][233][MUSIM] Running RRC CR for NR MUSIM enhancements (NN)

Scope: Update running RRC CR based on agreements in this meeting for NR Rel-18 MUSIM

Intended outcome: Endorsed running CR

Deadline: Very long (until RAN2#123, started after RAN2#122)