**3GPP TSG RAN WG2 Meeting #131bis R2-250xxxx  
Prague, Czech Republic, 13 – 17 October 2025**

**Agenda item: 8.4.1**

**Source: Apple (Rapporteur)**

**Title: Open issues on Rel-19 LPWUS 38.321 CR**

**WID/SID: NR\_LPWUS-Core – Release 19**

**Document for: Discussion and Decision**

# 1 Introduction

As part of email discussion [Post131][213][LPWUS] CR for TS 38.321 (Apple)”, this document is to **collect open issues on Rel-19 LPWUS 38.321 CR (R2-2506613)**.

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| * [Post131][213][LPWUS] CR for TS 38.321 (Apple)   Intended outcome: Agree the CR for TS 38.321  Deadline:   1. Initial list of open issues by rapporteur, proposed resolutions for easy open issues or resolution options for other issues: sept. 19th 2. Inputs from other companies and identification of issues that require contribution input: Sept. 26th 3. Final set of proposals and resolutions for issues that don’t require contribution input: Oct. 1st |

## Contact information:

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| --- | --- | --- |
| Company | Delegate Name | Email |
| Apple | Fangli XU | fangli\_xu@apple.com |
| Ericsson | Martin van der Zee | martin.van.der.zee@ericsson.com |
| OPPO | Haocheng Wang | wanghaocheng1@oppo.com |
| ZTE | QI Tao | qi.tao3@zte.com.cn |
| Vivo | Chenli | Chenli5g@vivo.com |

# 2 Discussion

Companies are invited to describe any identified open issues in the table below.

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| --- | --- | --- |
| **Company+issue #**  **(e.g. Apple 001)** | **Description of open issues and potential resolution** | **Rapporteur comment** |
| Eri-001 | RAN2 agreed:   * For Option 1-2, UE does not start the lpwus-PDCCH-MonitoringTimer in collision cases, i.e. when the UE is not able to monitor the LP-WUS occasion(s). Can discuss if critical issue identified with this mechanism.   For certain configurations, where the LP-WUS monitoring occasions are sparse, e.g. smaller equal to the C-DRX cycle length, the UE becomes “temporarily” unreachable when it misses 2 or 3 consecutive LP-WUS occasions.  The NW should be allowed to configure the number of consecutive LOs the UE is allowed to miss due to collisions before the UE needs to start the timer. | According to RAN2 agreement, this issue can be further discussed.  **Issue#1: Revisit the UE operation in LP-WUS collision for Option 1-2**  **Description:** The revisit needs to be based on critical issues in the current RAN2 agreement. |
| OPPO-001 | For a UE configured with both secondary DRX group and LP-WUS option 1-1 on PCell, there may be a case that primary DRX group is in short DRX cycle and secondary DRX group is in long DRX cycle. It is unclear whether UE monitors LP-WUS in this case. We need to discuss and clarify the UE behaviors. | According to RAN2#129bis agreement, for Option 1-1 UE doesnot monitor LP-WUS when short DRX cycle is used.  The agreement should be also applicable for the dual DRX group with LP-WUS Option 1-1 configuration, i.e. UE doesnot monitor LP-WUS when short DRX cycle is used in either DRX group.  *=> For Option 1-1, the UE does not monitor LP-WUS when Short DRX cycle is used. (RAN2#129bis agreement)*  **Proposal:** Confirm UE doesnot monitor LP-WUS when short DRX cycle is used in either DRX group when secondary DRX group is configured. |
| ZTE-001 | For UE in RRC\_CONNECTED state, the condition for UE to monitor LP-WUS has been defined, but how NW knows that the UE is monitoring LP-WUS has not been specified, i.e., NW is not aware of whether UE monitors LP-WUS, and network behaviour is not defined.  This results in misalignment, especially in option 1-2, UE starts *lpwus-PDCCH-MonitoringTimer* and monitors PDCCH when the LP-WUS monitoring condition is met, and UE starts drx-onDurationTimer and monitors PDCCH as legacy when the LP-WUS monitoring condition is not met. Since gNB does not know whether the LP-WUS monitoring condition is met or not, whether to send PDCCH based on LP-WUS mechanism or legacy mechanism cannot be decided, which result in ambiguity and potentially network resource waste.  This issue should be discussed. | Based on RAN1 and RAN2 discussion, the CONNECTED UE enables the LP-WUS monitoring only based on RRC configuration. and there is no further activation/deactivation or fallback mechanism introduced.  Therefore, there is no additional monitoring condition to control the LPWUS monitoring.  If the condition mentioned here refers to the collision case, it can be covered by Issue#1.  If clarification is needed, we can confirm the UE operation.  **Proposal:** Confirm UE enables/ the LP-WUS monitoring only based on RRC configuration.  The UE can only start monitoring LP-WUS after RRC configuration. But it is up to the UE, when LP-WUS is configured, to stop monitoring LP\_WUS and directly monitor PDCCH.  See also related discussion in H050 and E043.  [Rapp] Here we focus on the network control to enabling the LP-WUS monitoring. When the LP-WUS configuration is provided, if UE implementation decides not to monitor LP-WUS, UE is required to assume its LP-WUS indication is received for each occasion, and start the DRX onduration Timer (for Option 1-1) and LPWUS PDCCH monitoring Timer (for Option 1-2).  For this proposal for clarification, we can just focus on the enable case. |
| Vivo 001 | **UE behaviour when *lpwus-PDCCH-MonitoringTimer* is notrunning**  For Option 1-2, when *lpwus-PDCCH-MonitoringTimer* is notrunning and UE is not in Active Time, the UE should follow the legacy behaviour as in non-active time, i.e. cannot transmit SRS or report CSI. But this condition is missed in the current specification.  It should be updated as:  1> else:  2> in current symbol n, if a DRX group would not be in Active Time considering grants/assignments scheduled on Serving Cell(s) in this DRX group and DRX Command MAC CE/Long DRX Command MAC CE received and Scheduling Request sent until 4 ms prior to symbol n when evaluating all DRX Active Time conditions as specified in this clause; and  2> if *lpwus-PDCCH-MonitoringTimer* is not running (if configured); and[…]  3> not transmit periodic SRS and semi-persistent SRS defined in TS 38.214 [7] in this DRX group;  3> not report CSI on PUCCH and semi-persistent CSI configured on PUSCH in this DRX group. | In Option 1-2, there are two cases when *lpwus-PDCCH-MonitoringTimer* is notrunning:  Case 1: UE is not in CDRX activated time.  Following agreement has been captured in the MAC CR.  *=> For Option 1-2, network can configure whether UE reports periodic CSI/L1-RSRP during the time given by the configured drx-onDurationTimer, for the case when UE is outside C-DRX active time. (RAN2#127bis agreements)*  Case 2: UE is in CDRX active time.  According to following agreement, if UE is in CDRX active time according to legacy CDRX timer, UE operation is as legacy, which includes the PDCCH monitoring and CSI/SRS report. So this case has already been covered by the legacy DRX description.  *=> When UE is in C-DRX active time, UE PDCCH monitoring behaviors related to other legacy DRX timers (except for drx-onDurationTimer) are not affected. (RAN2#127bis agreements)*  I understand this issue is related to case 2. And as explained above, the UE operation has already covered by existing description. No changes are needed.  If clarification is needed, we can confirm the UE behavior for case 2.  **Proposal:** Confirm in Option 1-2 when UE is in CDRX active time but LP-WUS monitoring timer is not running, the legacy UE operation on CSI/SRS transmission in active time is applied. |
| Vivo 002 | **CSI report behaviour during *lpwus-PDCCH-MonitoringTimer* is running**  We have not extensively discussed the UE behaviour on CSI report during the PDCCH monitoring timer triggered by LP-WUS Option 1-2. It is better to discuss whether it would be same as the CSI report behaviour during active time within the *drx-onDurationTimer*, while the current specification means the behaviour is the same as in active time other than *drx-onDurationTimer*. | During *lpwus-PDCCH-MonitoringTimer* is running, UE is in CDRX active time, and the legacy operation on CSI/SRS transmission in active time should be applied.  If clarification is needed, we can confirm it.  **Proposal:** Confirm in Option 1-2 when UE is in CDRX active time and LP-WUS monitoring timer is running, the legacy UE operation on CSI/SRS transmission in active time is applied. |
| Vivo 003 | **Whether/How to capture option 1-1/1-2 description in MAC or stage-2 specification**  In the first version of MAC running CR, there was some description for “option 1-1” and “option 1-2”. And in the later version, it was removed based on companies’ comments.  In the current MAC specification, option 1-2 is differentiated by the condition “if *lpwus-PDCCH-MonitoringTimer* is configured”. But the present condition for parameter “*lpwus-PDCCH-MonitoringTimer*” is “this field is mandatory present for option 1-2”. This leads to mutually dependent circular conditions.  Besides, there are other configurations with the condition of option 1-1/option 1-2.  To resolve above problem and simplify the description in RRC, we request to discuss how to capture the description in MAC or stage-2 for “option 1-1” “option 1-2” or some similar description. | The options 1-1/1-2 description was removed from the MAC CR according to majority view.  I understand that the current stage-2 38.300 CR already includes descriptions of option 1-1/1-2 in section 11, but it does not explicitly mention options 1-1/1-2. (see below)    we can discuss the necessity of modifications based on the description of stage-2.  The necessity to explicitly describe “option 1-1/1-2” can be discussed based on the 38.300 description.  **Proposal:** Further discuss the necessity to explicitly describe “option1-1/1-2” based on 38.300 description. |

Based on company input, the LP-WUS MAC issues can be summarized as follows:

**Proposal 1:** Revisit the UE operation in LP-WUS collision for Option 1-2, which should be based on critical issues in the current RAN2 agreements. (based on contribution)

**Proposal 2:** Confirm UE doesnot monitor LP-WUS when short DRX cycle is used in either DRX group when secondary DRX group is configured.

**Proposal 3:** Confirm UE enables the LP-WUS monitoring only based on RRC configuration.

**Proposal 4:** Confirm in Option 1-2 when UE is in CDRX active time but LP-WUS monitoring timer is **not** running, the legacy UE operation on CSI/SRS transmission in active time is applied.

**Proposal 5:** Confirm in Option 1-2 when UE is in CDRX active time and LP-WUS monitoring timer is running, the legacy UE operation on CSI/SRS transmission in active time is applied.

**Proposal 6:** Further discuss the necessity to explicitly describe “option1-1/1-2” based on 38.300 description. (based on contribution)

# 3 Conclusion

In this contribution, we collect open issues of Rel-19 LPWUS 38.321 CR. Based on above discussion, following open issues are identified: