**3GPP TSG RAN WG2 Meeting #129 R2-250xxxx
 Wuhan, China, 7th - 11th April 2025**

**Agenda item: 8.4.1**

**Source: ZTE Corporation, Sanechips**

**Title: Discussion for 37.340 CR**

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

**Document for: Discussion and Decision**

# 1 Introduction

This is a discussion document on 37.340 related issues for LP-WUS:

* [Post129][213][LPWUS] Running CR for TS 37.340 (ZTE)

Intended outcome: Running CR for submission to the next meeting

Deadline: Long

# 2 Discussion

## Issue 1: LP-WUS monitoring in NR-DC

The following agreements have been achieved in RAN1#118bis for the support of LP-WUS for DC case:

Agreement

LP-WUS is supported when UE is configured with NR-DC in RRC CONNECTED mode

* Above is supported for the case PDCCH monitoring is triggered by LP-WUS in the same cell group
* FFS: The cell(s) where PDCCH monitoring triggered by a LP-WUS is applicable

For NR-DC case when LP-WUS is supported, RAN1 has agreed that LP-WUS can only trigger PDCCH monitoring in the same cell group. We understand the LP-WUS operation would be per cell group.

Then within each cell group, it is worth considering the LP-WUS monitoring and the follow up PDCCH monitoring behaviors.

In NR-DC MCG, similar as the DCP monitoring, we understand the LP-WUS can only be configured to be monitored on the PCell.

**Question 1: Do companies agree that in NR-DC MCG, the LP-WUS can only be configured to be monitored on the PCell?**

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| **Company** | **Yes/No** | **Comments** |
| Ericsson | Yes | We do not see the purpose of other configuration options.FYI: the RAN1 agreement from Athens is still open whether LP-WUS is only configured on PCell/PSCell. But it is clear that when LP-WUS is detected all serving cells of the cell group wake-up and enter Active Time:**Agreement*** For the case when UE is configured with NR-DC with CA without dual DRX groups or without CA in RRC CONNECTED mode,
	+ LP-WUS can be configured on a serving cell per cell-group
		- This does not imply that LP-WUS has to be configured on both cell groups
	+ LP-WUS indication is applicable to all serving cells in the cell-group
		- Note: There is no impact to PDCCH monitoring behaviour related to SCell dormancy/activation/deactivation
	+ FFS whether to support this case as separate UE capability from CA case
	+ FFS UE capability for monitoring LP-WUS on one cell group or both cell groups
* FFS: Whether the serving cell on which the LP-WUS is configured is only PCell/PSCell or can be RRC configured cell other than Pcell/PSCell
 |
| Huawei, HiSilicon | Wait for RAN1 | RAN1 is discussing: FFS: Whether the serving cell on which the LP-WUS is configured is only PCell/PSCell or can be RRC configured cell other than Pcell/PSCellWe understand **at least Pcell/PSCell** can be supported, but whether SCell can also configured with LP-WUS depends on further RAN1 conclusion. |
| Lenovo | Yes | We prefer to reuse the principle of DCP that LP-WUS is configured on the Pcell for NR-DC MCG, but since the issue is under RAN1’s discussion, we are wondering whether RAN2 needs to make such conclusions or pending on RAN1’s agreement. |
| Sharp | Yes | The same way for DCP can be reused. Considering RAN1 is discussing this issue, maybe RAN2 can make a working assumption first and then revisit it if needed. |
| CATT | Wait for RAN1 | Considering RAN1 has left FFS on “*Whether the serving cell on which the LP-WUS is configured is only PCell/PSCell or can be RRC configured cell other than Pcell/PSCell*” and in order to avoid duplicated discussion, we think RAN2 can wait for RAN1’s further agreement. |
| Samsung | Yes |  |
| Xiaomi | Wait for RAN1 | This is an FFS issue in RAN1 as per RAN1 chairman notes. |
| Huawei, HiSilicon | Wait for RAN1 | RAN1 has an FFS as below: FFS: Whether the serving cell on which the LP-WUS is configured is only PCell/PSCell or can be RRC configured cell other than Pcell/PSCellI agree Pcell/PSCell can be supported, but whether SCell can also be configured with LP-WUS needs further discussion in RAN1. |
| ZTE | Yes |  |
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For NR-DC SCG, similar as the DCP monitoring, we understand the LP-WUS can only be configured to be monitored on the PSCell.

**Question 2: Do companies agree that in NR-DC SCG, the LP-WUS can only be configured to be monitored on the PSCell?**

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| **Company** | **Yes/No** | **Comments** |
| Ericsson | Yes | Same as for Q2 |
| Huawei, HiSilicon | Wait for RAN1 | Same as for Q2. |
| Lenovo | Yes |  |
| Sharp | Yes |  |
| CATT | Wait for RAN1 | Same as for Q1 |
| Samsung | Yes |  |
| Xiaomi | Wait for RAN1 | Same as for Q1 |
| vivo | Wait for RAN1 | Same as above. |
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Rapporteur’s Summary:

9 companies provided feedback on Q1 and Q2. 5 companies agreed that in NR-DC MCG, the LP-WUS can only be configured to be monitored on the PCell while 4 companies pointed out that RAN1 is still discussing whether LP-WUS can be configured on other cells than PCell and PSCell.

The following proposal is given based on the comments provided:

**Proposal 1: For NR-DC, the LP-WUS can be configured to be monitored at least on the PCell and PSCell. Wait for RAN1 progress on whether to allow LP-WUS configuration and monitoring on other Cells.**

RAN1 has agreed that LP-WUS can only trigger PDCCH monitoring in the same cell group. We understand the LP-WUS operation would be per cell group and the LP-WUS in PCell of MCG and PSCell of SCG should be configured and to be monitored independently.

**Question 3: Do companies agree that the LP-WUS in PCell of MCG and PSCell of SCG should be configured and to be monitored independently?**

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| **Company** | **Yes/No** | **Comments** |
| Ericsson | Yes |  |
| Huawei, HiSilicon | Yes for intention | We understand LP-WUS configuration and operation for MCG and SCG is independent. But whether only Pcell/PSCell can be configured depends on the Q1/2. |
| Lenovo | Yes, with comments | We agree the principle that LP-WUS in PCell of MCG and PSCell of SCG should be configured and to be monitored independently. Additionally, since it has been agreed that different LP-WUS options (i.e., opti1-1 and opt1-2) for RRC-CONNECTED mode cannot be configured simultaneously for the same UE. Then, the case that MCG and SCG are configured with different LP-WUS options should be avoided. Whether the coordination on LP-WUS configuration between MN and SN is needed, which may need further discussion on RAN3. |
| Sharp | Yes | In our understanding, the restriction of Option 1-1 and Option 1-2 not simultaneously configured for the same UE is applicable for the same cell group, and MCG and SCG can configure different options. |
| CATT | Yes with intention | We share the same view with HW. |
| Samsung | Yes |  |
| Xiaomi | Yes |  |
| vivo | Yes | We understand the intention is correct. Whether Scell can be configured with LP-WUS needs RAN1 further progress.  |
| ZTE | Yes |  |
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Rapporteur’s Summary:

9 companies provided feedback on Q3 and all the companies agree that the LP-WUS in MCG and SCG can be configured and to be monitored independently. Lenovo raised that MCG and SCG configured with different LP-WUS options should be avoided while Sharp do not see the need for such restriction.

The following proposal is given based on the comments provided:

**Proposal 2: For NR-DC, the LP-WUS in MCG and SCG can be configured independently.**

## Issue 2: LP-WUS support in MR-DC

**Question 4:** **For the following MR-DC scenarios, which scenario(s) companies would like to support LP-WUS?**

* **NE-DC**
* **EN-DC**
* **NGEN-DC**
* **All**
* **None**

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| --- | --- | --- |
| **Company** | **NE-DC/EN-DC/NGEN-DC/all/None?** | **Comments** |
| Huawei, HiSilicon | All | Similar as DCP. |
| Ericsson | All | Assuming that there is no additional specification impact, except capturing in 37.340 that these scenarios are supported with LP-WUS. |
| Lenovo | NE-DC, NGEN-DC | In principle, the LP-WUS can be configured in MCG if MN is a gNB and configured in SCG if SN is a gNB. Both NE-DC and NGEN-DC can be supported. While for EN-DC, not sure whether the incompatibility issue exists with the EPC network. |
| Sharp | All |  |
| CATT | All |  |
| Samsung | All | As DCP. |
| Xiaomi | All |  |
| Vivo | All |  |
| ZTE | All |  |
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Rapporteur’s Summary:

9 companies provided feedback on Q4 and 8 companies agree that the LP-WUS can be supported in NE-DC, EN-DC, NGEN-DC apart from NR-DC while Lenovo is not sure about EN-DC.

The following proposal is given based on the majority’s preference.

**Proposal 3: Apart from NR-DC, LP-WUS can also be supported in NE-DC, EN-DC, NGEN-DC. And proposal 1 and 2 also apply to NE-DC, EN-DC, NGEN-DC.**

# 3 Comments on the CR

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| **Company** | **Comments** | **Rapporteur Feedback** |
| Ericsson | One minor comment/suggestion:For DCP it says:In MR-DC, for power saving purpose, the UE can be configured with DCP …For LP-WUS it says:In NR-DC, the UE can be configured with LP-WUS …We could also consider, dependent on whether option 1-1 or 1-2 is configured:In NR-DC, for power saving or latency purpose, the UE can be configured with LP-WUS … | OK, I will add it. |
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# Conclusion

Based on post-meeting email discussion, the following proposals are given for formal decision:

**Proposal 1: For NR-DC, the LP-WUS can be configured to be monitored at least on the PCell and PSCell. Wait for RAN1 progress on whether to allow LP-WUS configuration and monitoring on other Cells.**

**Proposal 2: For NR-DC, the LP-WUS in MCG and SCG can be configured independently.**

**Proposal 3: Apart from NR-DC, LP-WUS can also be supported in NE-DC, EN-DC, NGEN-DC. And proposal 1 and 2 also apply to NE-DC, EN-DC, NGEN-DC.**