**3GPP TSG-WG2 #131 *R2-25xxxxx***

**Bengaluru, India, 25th – 29th August 2025**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **37.340** | **CR** | **0420** | **rev** | **-** | **Current version:** | **18.6.0** |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
|  | | | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME | **x** | Radio Access Network | **x** | Core Network |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | Introduction of LP-WUS in TS 37.340 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | ZTE Corporation, Sanechips | | | | | | | | | |
| ***Source to TSG:*** | R2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_LPWUS-Core | | | | |  | ***Date:*** | | | 2025-09-02 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-19 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Introduction of Rel-19 LP-WUS in TS 37.340 | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Introduction of Rel-19 LP-WUS in TS 37.340   * Support of LP-WUS in MR-DC. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Rel-19 LP-WUS is not captured in TS 37.340 | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 3.2, 6.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **x** |  | Other core specifications | | | | TS 38.300 CR 1015  TS 38.304 CR 0440  TS 38.331 CR 5416  TS 38.321 CR 2103 | | |
| ***affected:*** | |  |  | Test specifications | | | |  | | |
| ***(show related CRs)*** | |  |  | O&M Specifications | | | |  | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

Start of Change

## 3.2 Abbreviations

For the purposes of the present document, the abbreviations given in TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in TR 21.905 [1], TS 36.300 [2] and TS 38.300 [3].

BFD Beam Failure Detection

CHO Conditional Handover

CLI Cross Link Interference

CPA Conditional PSCell Addition

CPAC Conditional PSCell Addition or Change

CPC Conditional PSCell Change

DAPS Dual Active Protocol Stack

DC Intra-E-UTRA Dual Connectivity

DCP DCI with CRC scrambled by PS-RNTI

EN-DC E-UTRA-NR Dual Connectivity

IAB Integrated Access and Backhaul

IDC In-Device Coexistence

LTM L1/L2 Triggered Mobility

LP-WUS Low Power Wake-Up Signal

MCG Master Cell Group

MN Master Node

MR-DC Multi-Radio Dual Connectivity

MUSIM Multi-Universal Subscriber Identity Module

NE-DC NR-E-UTRA Dual Connectivity

NGEN-DC NG-RAN E-UTRA-NR Dual Connectivity

NR-DC NR-NR Dual Connectivity

QMC QoE Measurement Collection

QoE Quality of Experience

RLM Radio Link Monitoring

SCG Secondary Cell Group

SMTC SS/PBCH block Measurement Timing Configuration

SN Secondary Node

SPR Successful PSCell Addition/Change Report

V2X Vehicle-to-Everything

Next Change

## 6.1 MAC Sublayer

In MR-DC, the UE is configured with two MAC entities: one MAC entity for the MCG and one MAC entity for the SCG. The serving cells other than the PCell can be activated/deactivated by RRC or MAC Control Element. For activation/deactivation by MAC Control Element, the serving cells of the MCG other than the PCell can only be activated/deactivated by the MAC Control Element received on MCG, and the serving cells of the SCG other than PSCell can only be activated/ deactivated by the MAC Control Element received on SCG. The MAC entity applies the bitmap for the associated cells of either MCG or SCG. When the SCG is not deactivated, the PSCell is always activated like the PCell (i.e. deactivation timer is not applied to PSCell). With the exception of PUCCH SCell, one deactivation timer is configured per SCell by RRC.

In MR-DC, semi-persistent scheduling (SPS) resources and configured grant (CG) resources can be configured on serving cells in both MCG and SCG.

In MR-DC, for 4-step RA type, contention based random access (CBRA) procedure is supported on both PCell and PSCell while contention free random access (CFRA) procedure is supported on all serving cells in both MCG and SCG. For 2-step RA type, CBRA can be supported on the PCell, if the MN is a gNB (i.e. for NE-DC and NR-DC) and on the PSCell, if the SN is a gNB (i.e, for EN-DC, NGEN-DC and NR-DC) while CFRA is only supported on the PCell, if the MN is a gNB (i.e. for NE-DC and NR-DC).

In (NG)EN-DC and NR-DC, when SCG is deactivated as described in clause 7.13, the TA timer associated with SCG continues running, the UE considers the TA is valid as long as TA timer is running. In case of SCG activation, the UE can be instructed by the network to perform random access towards PSCell even if the TA timer associated with PSCell is running and RLF and beam failure are not declared. Besides, the UE can be instructed by the network to perform SCG activation without performing random access, if the TA timer associated with PSCell is running and RLM and beam failure detection are configured but RLF or beam failure is not declared. In case of network-initiated SCG activation, both CBRA and CFRA on PSCell are supported. For CFRA, the dedicated RACH resources can be provided in the RRC message used to activate SCG.

In MR-DC, the BSR configuration, triggering and reporting are independently performed per cell group. For split bearers, the PDCP data is considered in BSR in the cell group(s) configured by RRC.

In MR-DC, separate DRX configurations are provided for MCG and SCG. A secondary DRX group can be configured in MR-DC for a cell group that includes cells in different Frequency Ranges as specified in TS 38.331 [4].

In MR-DC, PHR is independently configured per cell group. Events in one cell group can trigger power headroom reporting in both MCG and SCG. Power headroom information for one cell group is also included in a PHR transmitted in the other cell group. While the SCG is deactivated, PHR for SCG is not reported.

In MR-DC, consistent LBT failure recovery procedure as described in clause 5.6.1 in TS 38.300 [3] can be configured for both MAC entities of MCG and/or SCG when operating with shared spectrum channel access.

In MR-DC, for power saving purpose, the UE can be configured with DCP to be monitored on the PCell, if the MN is a gNB (i.e. for NE-DC and NR-DC) and/or with DCP to be monitored on the PSCell, if the SN is a gNB (i.e. for EN-DC, NGEN-DC and NR-DC).

In MR-DC, the UE may be configured with enhanced intra-UE overlapping resources prioritization on MN, if the MN is a gNB (i.e. for NE-DC and NR-DC) and on SN, if the SN is a gNB (i.e. for EN-DC, NGEN-DC and NR-DC).

In MR-DC, for power saving purpose, the UE supporting LP-WUS can be configured with LP-WUS to be monitored on the PCell, if the MN is a gNB (i.e. for NE-DC and NR-DC) and/or with LP-WUS to be monitored on the PSCell, if the SN is a gNB (i.e. for EN-DC, NGEN-DC and NR-DC).End of Change

Annex – Related Agreements

## RAN2 Agreements

### RAN2#129bis

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

### RAN2#130

* LP-WUS, if supported by UE, can only be configured to be monitored on the PCell, if the MN is a gNB (i.e. for NE-DC and NR-DC) and/or with LP-WUS to be monitored on the PSCell, if the SN is a gNB (i.e. for EN-DC, NGEN-DC and NR-DC).

### RAN2#131

* RAN2 understand that the RAN1 agreement on not supporting simultaneous LR and MR operation is only applicable within one cell group (with or without secondary DRX group configuration). Send LS to RAN1 for confirmation.

## RAN1 Agreements

### RAN1#118

**Agreement**

LP-WUS is at least supported for the case where a UE is configured with CA in RRC CONNECTED mode

* FFS: DC

### RAN1#118bis

**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

### RAN1#120

**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

### RAN1#120bis

**Agreement**

* For the case when UE is configured with CA without dual DRX groups in RRC CONNECTED mode, LP-WUS can be configured only on PCell
* 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 only on PCell/PSCell per cell-group

### RAN1#121

**Agreement:**

As the reply to RAN2 LS in R1-2503616, RAN1 assumes that UE is not able to operate LR and MR simultaneously in Rel-19. RAN1 understanding is that the terminology of LR and MR operations are for discussion purpose and will not be specified

* LR operation is the UE operation for LP-WUS monitoring
* MR operation is the UE operation for all other NR signals/channels transmissions/receptions in connected mode