**3GPP TSG-RAN WG2 meeting#112-e *draft\_R2-2010907***

**Online, 2nd - 13th November 2020**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **36.304** | **CR** | **0814** | **rev** | **1** | **Current version:** | **16.2.0** |  |
|  | | | | | | | | |
| *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 |  | Core Network |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | Clarification to the last used cell for (G)WUS | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, HiSilicon | | | | | | | | | |
| ***Source to TSG:*** | R2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NB\_IOTenh3-Core, LTE\_eMTC5-Core | | | | |  | ***Date:*** | | | 2020-11-xx |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-16 |
|  | *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-12 (Release 12)* *Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | A GWUS capable eNB indicates to the CN the last used cell when releasing the S1/NG Connection. In case, this is not done the eNB include the field *nolastcellUpdate* in RRCConnectionRelease message to inform the UE that it should not update the cell that was last used for GWUS. However, the description in section 7.5.1 only mentions WUS.  Also, it is possible that during two connection attempts, the GWUS configuration is updated in system information and that a UE previously monitoring will now monitor GWUS or vice versa. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | In sections 7.4 and 7.5.1, clarify that after reception of *RRCConnectionRelease* including *noLastCellUpdate*, the UE monitors (G)WUS in the cell it was using (G)WUS prior to this RRC connection attempt.  **Impact Analysis**  Impacted functionality:  WUS, GWUS  Inter-operability:  The CR only impacts the UE, no inter-operability issue is foreseen. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The UE may not monitor WUS or GWUS after *noLastCellUpdate* was included in the *RRCConnectionRelease* even though it was previoulsy using WUS or GWUS in this cell. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 7.4, 7.5.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **X** |  | Other core specifications | | | | TS 36.331 CR 4479 | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

|  |
| --- |
| First change |

## 7.4 Paging with Wake Up Signal

Paging with Wake Up Signal is only used in the cell in which the UE most recently entered RRC\_IDLE triggered by:

- reception of *RRCEarlyDataComplete*; or

- reception of *RRCConnectionRelease* not including *noLastCellUpdate*; or

- reception of *RRCConnectionRelease* including *noLastCellUpdate* and the UE was using (G)WUS in this cell prior to this RRC connection attempt.

If the UE is in RRC\_IDLE, the UE is not using GWUS according to clause 7.5 and the UE supports WUS and WUS configuration is provided in system information, the UE shall monitor WUS using the WUS parameters provided in System Information. When DRX is used and the UE detects WUS the UE shall monitor the following PO. When extended DRX is used and the UE detects WUS the UE shall monitor the following *numPOs* POs or until a paging message including the UE's NAS identity is received, whichever is earlier. If the UE does not detect WUS the UE is not required to monitor the following PO(s). If the UE missed a WUS occasion (e.g. due to cell reselection), it monitors every PO until the start of next WUS or until the PTW ends, whichever is earlier.

- *numPOs* = Number of consecutive Paging Occasions (PO) mapped to one WUS provided in system information where (*numPOs*≥1).

The WUS configuration, provided in system information, includes time-offset between end of WUS and start of the first PO of the *numPOs* POs UE is required to monitor. The timeoffset in subframes, used to calculate the start of a subframe *g*0 (see TS 36.213 [6]), is defined as follows:

- for UE using DRX, it is the signalled *timeoffsetDRX*;

- for UE using eDRX, it is the signalled *timeoffset-eDRX-Short* if *timeoffset-eDRX-Long* is not broadcasted;

- for UE using eDRX, it is the value determined according to Table 7.4-1 if *timeoffset-eDRX-Long* is broadcasted

Table 7.4-1: Determination of GAP between end of WUS and associated PO

|  |  |  |  |
| --- | --- | --- | --- |
|  | | *timeoffset-eDRX-Long* | |
| *1000ms* | *2000ms* |
| *UE Reported wakeUpSignalMinGap-eDRX* | ***40ms or not reported*** | *timeoffset-eDRX-Short* | *timeoffset-eDRX-Short* |
| ***240ms*** | *timeoffset-eDRX-Short* | *timeoffset-eDRX-Short* |
| ***1000ms*** | *timeoffset-eDRX-Long* | *timeoffset-eDRX-Long* |
| ***2000ms*** | *timeoffset-eDRX-Short* | *timeoffset-eDRX-Long* |

The timeoffset is used to determine the actual subframe *g*0 as follows (taking into consideration resultant SFN and/or H-SFN wrap-around of this computation):

*g*0 = PO – timeoffset, where PO is the Paging Occasion subframe as defined in clause 7.1

For UE using eDRX, the same timeoffset applies between the end of WUS and associated first PO of the *numPOs* POs for all the WUS occurrences for a PTW.

The timeoffset, *g*0, is used to calculate the start of the WUS as defined in TS 36.213 [6].

|  |
| --- |
| Next change |

### 7.5.1 General

Paging with Group Wake Up Signal is only used in the cell in which the UE most recently entered RRC\_IDLE triggered by:

- reception of *RRCEarlyDataComplete*; or

- reception of *RRCConnectionRelease* not including *noLastCellUpdate*; or

- reception of *RRCConnectionRelease* including *noLastCellUpdate* and the UE was using (G)WUS in this cell prior to this RRC connection attempt.

When all of the following conditions are met then the UE shall monitor GWUS using the GWUS parameters provided in system information:

- the UE is in RRC\_IDLE;

- the UE supports GWUS;

- GWUS configuration (*gwus-Config*) is provided in system information;

- *groupAlternation* is present in g*wus-Config* and UE supports GWUS with group resource alternation; or

- *groupAlternation* is not present in *gwus-Config*.

A UE supporting GWUS can be configured to monitor a WUS group and a common WUS. Upon detecting either of them, UE shall monitor POs as defined in clause 7.4.

For NB-IoT, E-UTRAN may configure up to 2 WUS resources (numbered 0 and 1). The timeoffset, *g*0, from the end of WUS resource 0 to the start of corresponding PO is determined as defined in clause 7.4. When both *wus-Config* and g*wus-Config* are present, WUS resource 0 shares radio resources with *wus-Config*.The timeoffset from the end of WUS resource 1 to the start of corresponding PO is sum of the timeoffset *g*0 and the maximum WUS duration.

After the UE has determined the applicable gap between end of WUS resource and associated PO as specified in clause 7.4, UE selects the WUS group set for the corresponding gap as specified in clause 7.5.2. From the selected WUS group set, UE selects one WUS group as defined in clause 7.5.3. If *groupAlternation* is not present in *gwus-Config*, the UE monitors the selected WUS group with the corresponding timeoffset for each PO. If *groupAlternation* is present in *gwus-Config* and UE supports GWUS with group resource alternation, the UE determines the WUS group to monitor for each PO and the corresponding timeoffset as specified in clause 7.5.4.

For BL UEs and UEs in enhanced coverage, E-UTRAN may configure up to 4 WUS resources. The resource number, time and frequency location of these resources is determined as specified in clause 7.5.5.