**3GPP TSG-RAN WG2 Meeting #109bis-e *draft-*R2-2003920**

**Online, April 20th – April 30 2020**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **36.304** | **CR** | **0784** | **rev** | **1** | **Current version:** | **16.0.0** |  |
|  | | | | | | | | |
| *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)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME | **x** | Radio Access Network | **x** | Core Network |  |

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|  | | | | | | | | | | |
| ***Title:*** | Introduction of Rel-16 eMTC enhancements | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Nokia | | | | | | | | | |
| ***Source to TSG:*** | R2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | LTE\_eMTC5-Core | | | | |  |  | | | 2020-05-12 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***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:*** | | To capture the RAN2 agreements related to GWUS monitoring | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | New section for WUS Resource identification for BL UE and UE in enhanced coverage. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Rel-16 eMTC enhancements for GWUS will not be supported . | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **X** |  | Other core specifications | | | | TS 36.331 CR 4192 | | |
| ***affected:*** | | **X** |  | Test specifications | | | | TS 36.300 CR 1259 | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | |  | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |

|  |  |
| --- | --- |
| ***This CR's revision history:*** |  |

First Change

## 7.5 Paging with Group Wake Up Signal

### 7.5.1 General

When the UE supports GWUS and GWUS configuration (*gwus-Config*) is provided in system information, the UE shall monitor GWUS using the GWUS parameters provided in System Information.

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 time offset, *g*0, from the end of WUS resource 0 to the start of corresponding PO is determined as defined in subclause 7.4. When both *wus-Config* and g*wus-Config* are present, WUS resource 0 shares radio resources with *wus-Config.*The time offset from the end of WUS resource 1 to the start of corresponding PO is sum of the time offset *g*0 and the maximum WUS duration.

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 subclause 7.5..

### 7.5.2 WUS group set selection

### 7.5.3 WUS group selection

### 7.5.4 WUS Resource Location for BL UEs and UEs in Enhanced coverage

A BL UE or UE in enhanced coverage determines the time/frequency location of WUS resources based on freqLocation parameter which indicates the frequency location of WUS Resource ID 0 (. The frequency location of other WUS Resources (Resource ID 1,2,3) based on FreqLocation given in Table 7.5-1. The resource pattern which indicates the WUS Resources applicable for WUS Groups is signalled either by *resourceMappingPattern* or *resourceMappingPatternWithoutLegacy*.

Table 7.5.-1: WUS Resource frequency location

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| ***WUS Resource***  ***()*** | ***Frequency location of WUS Resource ID 0*** | | | | | |
| ***NB below centre frequency*** | | | ***NB above centre frequency*** | | |
| ***n0*** | ***n2*** | ***n4 (Note 1)*** | ***n0*** | ***n2*** | ***n4 (Note 1)*** |
| WUS Resource 1 | n2 | n0 | n2 | n2 | n4 | n2 |
| WUS Resource 2 | n0 | n2 | n4 | n0 | n2 | n4 |
| WUS Resource 2  (Note 2) | n4 | n4 | n0 | n4 | n0 | n0 |
| WUS Resource 3 | n2 | n0 | n2 | n2 | n4 | n2 |
| Note 1: This column is applicable if wus-Config is present.  Note 2: This row is applicable for the resource pattern ID 7 | | | | | | |

The time offset, *g*0, from the end of WUS resource 0 and WUS resource 1 to the start of corresponding PO is determined as defined in subclause 7.4. The time offset from the end of WUS resource 2 and WUS resource 3 to the start of corresponding PO is sum of the time offset *g*0 and the maximum WUS duration for all value of resource patterns except resource-Pattern-ID-7. The time offset g0 for WUS resource 2 is same as WUS resource 0 and 1 for resource pattern ID 7.

The WUS Resource IDs are selected based on as given in Table 7.5.4-2.

Table 7.5.4-2: WUS Resources applicable for Resource Pattern

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | **Resource Pattern\_ID** | | | | | | | |
| ***0*** | ***1*** | ***2*** | ***3*** | ***4*** | ***5*** | ***6*** | ***7*** |
| **WUS Resource**  ***()*** | ***0*** | X |  | X |  | X |  | X | X |
| ***1*** |  | X | X | X | X | X | X | X |
| ***2*** |  |  |  | X | X | X | X | X |
| ***3*** |  |  |  |  |  | X | X |  |
| ***Number of***  ***WUS Resources*** | | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 3 |

If = 0 is not used, the first entry in the *numGroupsList* corresponds to = 1. Otherwise, is the index of the WUS resources in *numGroupsList*.

End of Changes