**3GPP TSG-CT WG1 Meeting #137-eC1-225029**

**E-Meeting, 18th – 26th August 2022**

|  |
| --- |
| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
|  |
|  | **24.008** | **CR** | **3314** | **rev** | **-** | **Current version:** | **17.7.0** |  |
|  |
| *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 | **X** |

|  |
| --- |
|  |
| ***Title:***  | Introduction of the extended PTW length values for IDLE eDRX |
|  |  |
| ***Source to WG:*** | LG Electronics Inc., Ericsson, China Mobile, Huawei, HiSilcon, Qualcomm Incorporated |
| ***Source to TSG:*** | C1 |
|  |  |
| ***Work item code:*** | ARCH\_NR\_REDCAP |  | ***Date:*** | 2022-08-11 |
|  |  |  |  |  |
| ***Category:*** | F |  | ***Release:*** | Rel-17 |
|  | *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 canbe 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-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
|  |  |
| ***Reason for change:*** | 1. Two “NOTE x” presented in <Table 10.5.5.32/3GPP TS 24.008> are corrected to “NOTE 7”.
2. According to C1-224525 (LS on the maximum PTW length of IDLE eDRX), RAN2 agreed to support the maximum PTW length 40.96s.

<RAN2 agreements>1. The maximum PTW length is 40.96s when IDLE eDRX cycle is longer than 10.24s.
2. The minimum PTW length is 1.28s and the step length/granularity of PTW length is 1.28 when IDLE eDRX cycle is longer than 10.24s.

 However, in the current specification, the maximum length of NR PTW is defined as 20.48s. In addition, there is no spare bits to introduce more values. Therefore, new Extended Paging Time Window parameter is introduced.  |
|  |  |
| ***Summary of change:*** | 1. Two “NOTE x” are corrected to “NOTE 7” in <Table 10.5.5.32/3GPP TS 24.008>.
2. New Extended Paging Time Window parameter is introduced.
 |
|  |  |
| ***Consequences if not approved:*** | If 2nd change is not applied, the UE and the network cannot use the PTW whose length is greater than 20.48s when the IDLE eDRX value is greater than 10.24s in NR connected to 5GC. |
|  |  |
| ***Clauses affected:*** | 10.5.5.32 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** | **X** |  |  Other core specifications  | TS 24.501 CR 4627 |
| ***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 \* \* \* \*

#### 10.5.5.32 Extended DRX parameters

The purpose of the *Extended DRX parameters* information element is to indicate that the MS wants to use eDRX and for the network to indicate the Paging Time Window length value and the extended DRX cycle value to be used for eDRX.

The *Extended DRX parameters* is a type 4 information element with a minimum length of 3 octets and a maximum length of 4 octets.

The *Extended DRX parameters* information element is coded as shown in figure 10.5.5.32/3GPP TS 24.008 and table 10.5.5.32/3GPP TS 24.008.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Extended DRX parameters IEI | octet 1 |
| Length of Extended DRX parameters | octet 2 |
| Paging Time Window | eDRX value | octet 3 |
| Extended Paging Time Window | octet 4\* |

Figure 10.5.5.32/3GPP TS 24.008: Extended DRX parameters information element

Table 10.5.5.32/3GPP TS 24.008: Extended DRX parameters information element

|  |
| --- |
| Paging Time Window (PTW), octet 3 (bit 8 to 5) |
| The field contains a PTW value. The PTW value can be applied for Iu mode, WB-S1 mode, NB-S1 mode, WB-N1 mode and NB-N1 mode as specified below. |
| Iu modeThe field contains the PTW value in seconds for Iu mode. The PTW value is used as specified in 3GPP TS 23.682 [133a]. The PTW value is derived as follows: |
|  |  |
| bit |
| 8 | 7 | 6 | 5 | Paging Time Window length |
| 0 | 0 | 0 | 0 | 0 seconds (PTW not used) |
| 0 | 0 | 0 | 1 | 1 second |
| 0 | 0 | 1 | 0 | 2 seconds |
| 0 | 0 | 1 | 1 | 3 seconds |
| 0 | 1 | 0 | 0 | 4 seconds |
| 0 | 1 | 0 | 1 | 5 seconds |
| 0 | 1 | 1 | 0 | 6 seconds |
| 0 | 1 | 1 | 1 | 7 seconds |
| 1 | 0 | 0 | 0 | 8 seconds |
| 1 | 0 | 0 | 1 | 9 seconds |
| 1 | 0 | 1 | 0 | 10 seconds |
| 1 | 0 | 1 | 1 | 12 seconds |
| 1 | 1 | 0 | 0 | 14 seconds |
| 1 | 1 | 0 | 1 | 16 seconds |
| 1 | 1 | 1 | 0 | 18 seconds |
| 1 | 1 | 1 | 1 | 20 seconds |
| WB-S1 mode and WB-N1 mode The field contains the PTW value in seconds for WB-S1 mode and WB-N1 mode. The PTW value is used as specified in 3GPP TS 23.682 [133a] and 3GPP TS 23.501 [166]. The PTW value is derived as follows:bit |
| 8 | 7 | 6 | 5 | Paging Time Window length |
| 0 | 0 | 0 | 0 | 1,28 seconds |
| 0 | 0 | 0 | 1 | 2,56 seconds |
| 0 | 0 | 1 | 0 | 3,84 seconds |
| 0 | 0 | 1 | 1 | 5,12 seconds |
| 0 | 1 | 0 | 0 | 6,4 seconds |
| 0 | 1 | 0 | 1 | 7,68 seconds |
| 0 | 1 | 1 | 0 | 8,96 seconds |
| 0 | 1 | 1 | 1 | 10,24 seconds |
| 1 | 0 | 0 | 0 | 11,52 seconds |
| 1 | 0 | 0 | 1 | 12,8 seconds |
| 1 | 0 | 1 | 0 | 14,08 seconds |
| 1 | 0 | 1 | 1 | 15,36 seconds |
| 1 | 1 | 0 | 0 | 16,64 seconds |
| 1 | 1 | 0 | 1 | 17,92 seconds |
| 1 | 1 | 1 | 0 | 19,20 seconds |
| 1 | 1 | 1 | 1 | 20,48 seconds |
| NB-S1 mode and NB-N1 modeThe field contains the PTW value in seconds for NB-S1 mode and NB-N1 mode. The PTW value is used as specified in 3GPP TS 23.682 [133a] and 3GPP TS 23.501 [166]. The PTW value is derived as follows:bit |
| 8 | 7 | 6 | 5 | Paging Time Window length |
| 0 | 0 | 0 | 0 | 2,56 seconds |
| 0 | 0 | 0 | 1 | 5,12 seconds |
| 0 | 0 | 1 | 0 | 7,68 seconds |
| 0 | 0 | 1 | 1 | 10,24 seconds |
| 0 | 1 | 0 | 0 | 12,8 seconds |
| 0 | 1 | 0 | 1 | 15,36 seconds |
| 0 | 1 | 1 | 0 | 17,92 seconds |
| 0 | 1 | 1 | 1 | 20,48 seconds |
| 1 | 0 | 0 | 0 | 23,04 seconds |
| 1 | 0 | 0 | 1 | 25,6 seconds |
| 1 | 0 | 1 | 0 | 28,16 seconds |
| 1 | 0 | 1 | 1 | 30,72 seconds |
| 1 | 1 | 0 | 0 | 33,28 seconds |
| 1 | 1 | 0 | 1 | 35,84 seconds |
| 1 | 1 | 1 | 0 | 38,4 seconds |
| 1 | 1 | 1 | 1 | 40,96 seconds |
| In NR connected to 5GCN, the Paging Time Window field is ignored and the PTW value is included in the Extended Paging Time Window field. |
| eDRX value, octet 3 (bit 4 to 1) |
| The field contains an eDRX value. The eDRX values are applied for A/Gb mode, Iu mode, S1 mode and N1 mode as specified below.A/Gb modeThe field contains the eDRX value for A/Gb mode. The GERAN eDRX cycle length duration and Number of 51-MF per GERAN eDRX cycle values are derived from the eDRX value as follows: |
| bit |
| 4 | 3 | 2 | 1 | GERAN eDRX cycle length duration | Number of 51-MF per GERAN eDRX cycle |
| 0 | 0 | 0 | 0 | ~1,88 seconds (NOTE 1, NOTE 2) | 8 |
| 0 | 0 | 0 | 1 | ~3,76 seconds (NOTE 1, NOTE 2) | 16 |
| 0 | 0 | 1 | 0 | ~7,53 seconds (NOTE 1, NOTE 2) | 32 |
| 0 | 0 | 1 | 1 | 12,24 seconds (NOTE 2) | 52 |
| 0 | 1 | 0 | 0 | 24,48 seconds (NOTE 2) | 104 |
| 0 | 1 | 0 | 1 | 48,96 seconds (NOTE 2) | 208 |
| 0 | 1 | 1 | 0 | 97,92 seconds (NOTE 2) | 416 |
| 0 | 1 | 1 | 1 | 195,84 seconds (NOTE 2) | 832 |
| 1 | 0 | 0 | 0 | 391,68 seconds (NOTE 2) | 1664 |
| 1 | 0 | 0 | 1 | 783,36 seconds (NOTE 2) | 3328 |
| 1 | 0 | 1 | 0 | 1566,72 seconds (NOTE 2) | 6656 |
| 1 | 0 | 1 | 1 | 3133,44 seconds (NOTE 2) | 13312 |
|  |
| All other values shall be interpreted as 0000 by this version of the protocol. |
|  |
| NOTE 1: The listed values are rounded.NOTE 2: The value in seconds can be calculated with the formula ((3,06 / 13) \* (Number of 51-MF)). See 3GPP TS 45.001 [157], subclause 5.1. |
|  |
| Iu mode |
| The field contains the eDRX value for Iu mode. The UTRAN eDRX cycle length duration value is derived from the eDRX value as follows: |
| bit |
| 4 | 3 | 2 | 1 | UTRAN eDRX cycle length duration |
| 0 | 0 | 0 | 0 | 10,24 seconds |
| 0 | 0 | 0 | 1 | 20,48 seconds |
| 0 | 0 | 1 | 0 | 40,96 seconds |
| 0 | 0 | 1 | 1 | 81,92 seconds |
| 0 | 1 | 0 | 0 | 163,84 seconds |
| 0 | 1 | 0 | 1 | 327,68 seconds |
| 0 | 1 | 1 | 0 | 655,36 seconds |
| 0 | 1 | 1 | 1 | 1310,72 seconds |
| 1 | 0 | 0 | 0 | 1966,08 seconds |
| 1 | 0 | 0 | 1 | 2621,44 seconds |
|  |
| All other values shall be interpreted as 0000 by this version of the protocol. |
|  |
| S1 mode, NB-N1 mode, and WB-N1 modeThe field contains the eDRX value for S1 mode, NB-N1 mode, and WB-N1 mode. The eDRX cycle length duration value and the eDRX cycle parameter 'TeDRX' as defined in 3GPP TS 36.304 [121] are derived from the eDRX value as follows: |
| bit |
| 4 | 3 | 2 | 1 | eDRX cycle length duration | eDRX cycle parameter 'TeDRX' |
| 0 | 0 | 0 | 0 | 5,12 seconds (NOTE 4) | NOTE 3 |
| 0 | 0 | 0 | 1 | 10,24 seconds (NOTE 4) | 20 |
| 0 | 0 | 1 | 0 | 20,48 seconds | 21 |
| 0 | 0 | 1 | 1 | 40,96 seconds | 22 |
| 0 | 1 | 0 | 0 | 61,44 seconds (NOTE 5) | 6 |
| 0 | 1 | 0 | 1 | 81,92 seconds | 23 |
| 0 | 1 | 1 | 0 | 102,4 seconds (NOTE 5) | 10 |
| 0 | 1 | 1 | 1 | 122,88 seconds (NOTE 5) | 12 |
| 1 | 0 | 0 | 0 | 143,36 seconds (NOTE 5) | 14 |
| 1 | 0 | 0 | 1 | 163,84 seconds | 24 |
| 1 | 0 | 1 | 0 | 327,68 seconds | 25 |
| 1 | 0 | 1 | 1 | 655,36 seconds | 26 |
| 1 | 1 | 0 | 0 | 1310,72 seconds | 27 |
| 1 | 1 | 0 | 1 | 2621,44 seconds | 28 |
| 1 | 1 | 1 | 0 | 5242,88 seconds (NOTE 6) | 29 |
| 1 | 1 | 1 | 1 | 10485,76 seconds (NOTE 6) | 210 |
|  |
| All other values shall be interpreted as 0000 by this version of the protocol.NOTE 3: For E-UTRAN, and for E-UTRA connected to 5GCN, eDRX cycle length duration of 5,12 seconds the eDRX cycle parameter 'TeDRX' is not used as a different algorithm compared to the other values is applied. See 3GPP TS 36.304 [121] for details. |
| NOTE 4: The value is applicable only in WB-S1 mode and in WB-N1 mode. If received in NB-S1 mode or in NB-N1 mode it is interpreted as if the Extended DRX parameters IE were not included in the message by this version of the protocol.NOTE 5: The value is applicable only in WB-S1 mode and in WB-N1 mode. If received in NB-S1 mode or in NB-N1 mode it is interpreted as 0010 by this version of the protocol.NOTE 6: The value is applicable only in NB-S1 mode and in NB-N1 mode. If received in WB-S1 mode or in WB-N1 mode it is interpreted as 1101 by this version of the protocol. |
| NR connected to 5GCNThe field contains the eDRX value for NR connected to 5GCN. The eDRX cycle length duration value and the eDRX cycle parameter 'TeDRX' as defined in 3GPP TS 38.304 [183] are derived from the eDRX value as follows: |
| bit |
| 4 | 3 | 2 | 1 | eDRX cycle length duration | eDRX cycle parameter 'TeDRX' |
| 0 | 0 | 0 | 0 | 2,56 seconds | NOTE 7 |
| 0 | 0 | 0 | 1 | 5,12 seconds | NOTE 7 |
| 0 | 0 | 1 | 0 | 10,24 seconds | 20 |
| 0 | 0 | 1 | 1 | 20,48 seconds | 21 |
| 0 | 1 | 0 | 0 | 40,96 seconds | 22 |
| 0 | 1 | 0 | 1 | 81,92 seconds | 23 |
| 0 | 1 | 1 | 0 | 163,84 seconds | 24 |
| 0 | 1 | 1 | 1 | 327,68 seconds | 25 |
| 1 | 0 | 0 | 0 | 655,36 seconds | 26 |
| 1 | 0 | 0 | 1 | 1310,72 seconds | 27 |
| 1 | 0 | 1 | 0 | 2621,44 seconds | 28 |
| 1 | 0 | 1 | 1 | 5242,88 seconds | 29 |
| 1 | 1 | 0 | 0 | 10485,76 seconds | 210 |
|  |
| All other values shall be interpreted as 0000 by this version of the protocol.NOTE 7: For NR connected to 5GCN, eDRX cycle length durations of 2,56 seconds or 5,12 seconds the eDRX cycle parameter 'TeDRX' is not used as a different algorithm compared to the other values is applied. See 3GPP TS 38.304 [183] for details.NOTE 8: For NR connected to 5GCN, in this release of the specification, eDRX cycle length durations larger than 10.24 seconds are not supported for the UE in 5GMM-CONNECTED mode with RRC inactive indication. |
| Extended Paging Time Window (ePTW), octet 4 (bit 8 to 1)The field contains a PTW value. The PTW value is applied for NR connected to 5GCN as specified below.NR connected to 5GCNThe field contains the PTW value for NR connected to 5GCN. The PTW value is used as specified in 3GPP TS 23.501 [166]. The PTW value is derived as follows:bit |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  | Paging Time Window length |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | 1,28 seconds |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |  | 2,56 seconds |
| 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |  | 3,84 seconds |
| 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |  | 5,12 seconds |
| 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |  | 6,4 seconds |
| 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |  | 7,68 seconds |
| 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |  | 8,96 seconds |
| 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 |  | 10,24 seconds |
| 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |  | 11,52 seconds |
| 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |  | 12,8 seconds |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |  | 14,08 seconds |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 |  | 15,36 seconds |
| 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |  | 16,64 seconds |
| 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 |  | 17,92 seconds |
| 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 |  | 19,20 seconds |
| 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |  | 20,48 seconds |
| 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |  | 21,76 seconds |
| 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |  | 23,04 seconds |
| 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |  | 24,32 seconds |
| 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 |  | 25,6 seconds |
| 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |  | 26,88 seconds |
| 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 |  | 28,16 seconds |
| 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 |  | 29,44 seconds |
| 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 |  | 30,72 seconds |
| 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |  | 32 seconds |
| 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 |  | 33,28 seconds |
| 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 |  | 34,56 seconds |
| 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 |  | 35,84 seconds |
| 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 |  | 37,12 seconds |
| 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 |  | 38,4 seconds |
| 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 |  | 39,68 seconds |
| 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |  | 40,96 seconds |
|  |
| All other values shall be interpreted as 00000000 by this version of the protocol. |

\* \* \* End of Changes \* \* \* \*