**3GPP TSG-RAN2 Meeting #111-e *draft R2-200xxxx***

**Online, 17th Aug 2020 - 28th Aug 2020**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  | **36.331** | **CR** | **4358** | **rev** | -**1** | **Current version:** | **16.1.1** |  |
|  |
| *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:***  | Clarification on subframe level resource reservation for eMTC |
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| ***Source to WG:*** | ZTE Corporation, Sanechips |
| ***Source to TSG:*** | R2 |
|  |  |
| ***Work item code:*** | LTE\_eMTC5-Core |  | ***Date:*** | 2020-08-25 |
|  |  |  |  |  |
| ***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 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-12 (Release 12)**Rel-13 (Release 13)Rel-14 (Release 14)Rel-15 (Release 15)Rel-16 (Release 16)* |
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| ***Reason for change:*** | In R16, the subframe-level time-domain resource reservation capabilities(e.g. *subframeResourceResvDL-CE-ModeA-r16*, *subframeResourceResvDL-CE-ModeB-r16*, *subframeResourceResvUL-CE-ModeA-r16*, *subframeResourceResvUL-CE-ModeB-r16*) are introduced, but there is not explicit *subframeBitmap-r16* IEs, and the *slotBitmap-r16* IE is used to indicate the subframe-level time-domain resource reservation(e.g. the two bits of slot Bitmap for each subframe are set to “00” or “11”).So, it is necessary to specify the slot Bitmap configuration restriction for the UEs only with subframe-level time-domain resource reservation capability. |
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| ***Summary of change:*** | To describe in the field description of *slotBitmap* IE that only “00” or “11” are valid reservation setting for the two bits of each subframe for UE not supporting slot-level resource reservation.**Impact Analysis**Impacted functionality:The changes only impacts the resource reservation for the UEs only with the subframe-level time-domain resource reservation capability.Inter-operability:No inter-operability issue is found.  |
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| ***Consequences if not approved:*** | Incorrect value of *slotBitmap* IE may be configured to UEs only with the subframe-level time-domain resource reservation capability. |
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| ***Clauses affected:*** | 6.3.2 |
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|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **x** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **x** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **x** |  O&M Specifications | TS/TR ... CR ...  |
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| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

**<Start of the modified section>**

#### – *ResourceReservationConfig*

The IE *ResourceReservationConfig* is used to specify the resource reservation, e.g. for coexistence with NR.

*ResourceReservationConfig* information element

-- ASN1START

ResourceReservationConfigDL-r16 ::= SEQUENCE {

 periodicityStartPos-r16 PeriodicityStartPos-r16,

 resourceReservationFreq-r16 CHOICE {

 rbg-Bitmap1dot4 BIT STRING (SIZE (6)),

 rbg-Bitmap3 BIT STRING (SIZE (8)),

 rbg-Bitmap5 BIT STRING (SIZE (13)),

 rbg-Bitmap10 BIT STRING (SIZE (17)),

 rbg-Bitmap15 BIT STRING (SIZE (19)),

 rbg-Bitmap20 BIT STRING (SIZE (25))

 } OPTIONAL, -- Need OP

 slotBitmap-r16 CHOICE {

 slotPattern10ms BIT STRING (SIZE (20)),

 slotPattern40ms BIT STRING (SIZE (80))

 },

 symbolBitmap1-r16 BIT STRING (SIZE (7)) OPTIONAL, -- Cond Bitmap1

 symbolBitmap2-r16 BIT STRING (SIZE (7)) OPTIONAL, -- Cond Bitmap2

 ...

}

ResourceReservationConfigUL-r16 ::= SEQUENCE {

 periodicityStartPos-r16 PeriodicityStartPos-r16,

 slotBitmap-r16 CHOICE {

 slotPattern10ms BIT STRING (SIZE (20)),

 slotPattern40ms BIT STRING (SIZE (80))

 } OPTIONAL, -- Cond FDDandTDDnoDL

 symbolBitmap1-r16 BIT STRING (SIZE (7)) OPTIONAL, -- Cond Bitmap1

 symbolBitmap2-r16 BIT STRING (SIZE (7)) OPTIONAL, -- Cond Bitmap2

 ...

}

PeriodicityStartPos-r16 ::= CHOICE {

 periodicity10ms NULL,

 periodicity20ms INTEGER(0..1),

 periodicity40ms INTEGER(0..3),

 periodicity80ms INTEGER(0..7),

 periodicity160ms INTEGER(0..15),

 spare3 NULL, spare2 NULL, spare1 NULL

}

-- ASN1STOP

| *ResourceReservationConfig* field descriptions |
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| ***periodicityStartPos***Indicates periodicity and start offset of the reserved resources. Value set to *periodicity10ms* corresponds to periodicity 10 milliseconds and corresponding start position is 0, value set to *periodicity20ms* corresponds to periodicity 20 milliseconds and corresponding start position in milliseconds = indicated value \* 10ms, and so on. |
| ***resourceReservationFreq***Downlink frequency domain resource reservation bitmap where each bit corresponds to a resource block group (RBG), see TS 36.213 [23]. Value *rbg-Bitmap1dot4* corresponds to 1.4 MHz system bandwidth, value *rbg-Bitmap3* corresponds to 3 MHz system bandwidth, and so on. If the field is absent, all RBGs in the system bandwidth are reserved. |
| ***slotBitmap***Slot-level resource reservation configuration. Value *slotPattern10ms* corresponds to 10ms slot pattern and *slotPattern40ms* corresponds to 40ms slot pattern, see TS 36.213 [23] for DL and TS 36.211 [21] for UL.The first/leftmost 2-bits corresponds to the subframe #0 of the radio frame satisfying SFN mod periodicity = start position, as indicated by *periopdicityStartPos*. Two bits for each subframe coded as:00: both slots are not reserved01: the first slot is not reserved, the second slot is reserved10: the first slot is reserved, the second slot is not reserved11: both slots are reserved.If the field is not included in UL configuration, the value of the field from DL configuration applies.For a UE that supports subframe-level resource reservation but does not support slot-level resource reservation, the 2 bits for each subframe are interpreted as:00: subframe is not reserved01: invalid reservation10: invalid reservation11: subframe is reserved. |
| ***symbolBitmap1, symbolBitmap2***Provides the symbol-level resource reservation for one subframe. If *symbolBitmap1* is absent, value '01' in the *slotBitmap* corresponds to the whole 2nd slot being reserved. If *symbolBitmap2* is absent, value '10' in the *slotBitmap* corresponds to the whole 1st slot being reserved. |

| Conditional presence | Explanation |
| --- | --- |
| *Bitmap1* | The field is optionally present, need OR, if value of *slotBitmap* corresponding to at least one subrame is '01'; otherwise the field is not present. |
| *Bitmap2* | The field is optionally present, need OR, if value of *slotBitmap* corresponding to at least one subrame is '10'; otherwise the field is not present. |
| *FDDandTDDnoDL* | The field is mandatory present for TDD when resource reservation for DL is not configured, and for FDD; otherwise the field is optionally present, need OP. |

**<End of the modified section>**