**3GPP TSG-RAN WG2 Meeting #131bis R2-2507787**

**Prague, Czech Republic, Oct. 13th-17th**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **36.331** | **CR** | **5160** | **rev** | **2** | **Current version:** | **19.0.0** |  |
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| *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:*** | Rapporteur correction on IoT NTN Ph3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, HiSilicon | | | | | | | | | |
| ***Source to TSG:*** | R2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | IoT\_NTN\_Ph3-Core | | | | |  | ***Date:*** | | | 2025-10-24 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***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)* | |
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| ***Reason for change:*** | | This CR is to capture the corrections from the agreed RILs based on the RIL status in R2-2507060 and the agreements made in RAN2#131bis.  Besides, the CR also introduces changes to support CB-Msg3 EDT for IoT NTN TDD. | | | | | | | | |
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| ***Summary of change:*** | | This CR captures the corrections from the following agreed RILs based on the RIL status in R2-2507060 and the agreements made in RAN2#131bis:  V212, V213, N011, N013, V216, W801.  Besides, the configurations that are aligned with the 90 ms periodicity for npusch-Periodicity and windowPeriodicity-NB are introduced. | | | | | | | | |
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| ***Consequences if not approved:*** | | There will be errors related IoT NTN Ph3 in the RRC specification. | | | | | | | | |
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| ***Clauses affected:*** | | 5.2.1.3, 5.2.2.7, 5.3.3.1b, 5.3.3.2, 5.3.3.3a, 5.3.3.3b, 5.3.3.3e, 6.3.1, 6.3.2, 6.7.3.1, 6.7.3.2, 6.7.3.6 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

Start of Change

#### 5.2.1.3 System information validity and notification of changes

Change of system information (other than for ETWS, CMAS, EAB, UAC, and satellite assistance information parameters except for discontinuous coverage scenarios and for NB-IoT, other than for AB parameters and satellite assistance information parameters except for discontinuous coverage scenarios) only occurs at specific radio frames, i.e. the concept of a modification period is used. System information may be transmitted a number of times with the same content within a modification period, as defined by its scheduling. The modification period boundaries are defined by SFN values for which SFN mod *m*= 0, where *m* is the number of radio frames comprising the modification period. The modification periodis configured by system information. If H-SFN is provided in *SystemInformationBlockType1-BR*, modification period boundaries for BL UEs and UEs in CE are defined by SFN values for which (H-SFN \* 1024 + SFN) mod *m*=0. For NB-IoT, H-SFN is always provided and the modification period boundaries are defined by SFN values for which (H-SFN \* 1024 + SFN) mod *m*=0.

To enable system information update notification for RRC\_IDLE UEs configured to use a DRX cycle longer than the modification period, an eDRX acquisition period is defined. The boundaries of the eDRX acquisition period are determined by H-SFN values for which H-SFN mod 256 =0. For NB-IoT, the boundaries of the eDRX acquisition period are determined by H-SFN values for which H-SFN mod 1024 =0.

NOTE 1: If the UE in RRC\_IDLE is configured to use extended DRX cycle, e.g., in the order of several minutes or longer, in case the eNB is reset the UE SFN may not be synchronized to the new eNB SFN. The UE is expected to recover, e.g., acquire MIB within a reasonable time, to avoid repeated paging failures.

NOTE 1a: For the UE in RRC\_INACTIVE, the idle mode extended DRX cycle, if configured, is used to compare with the modification period.

When the network changes (some of the) system information, it first notifies the UEs about this change, i.e. this may be done throughout a modification period. In the next modification period, the network transmits the updated system information. During a modification period where ETWS or CMAS transmission is started or stopped, the SI messages carrying the SIBs scheduled in *schedulingInfoListExt* and/or SI messages carrying the posSIBs scheduled in *posSchedulingInfoList* may change, so the UE might not be able to successfully receive those SIBs and/or posSIBs in the remainder of the current modification period and next modification period according to the scheduling information received prior to the change. These general principles are illustrated in figure 5.2.1.3-1, in which different colours indicate different system information. Upon receiving a change notification, the UE not configured to use a DRX cycle that is longer than the modification period acquires the new system information immediately from the start of the next modification period. Upon receiving a change notification applicable to eDRX, a UE in RRC\_IDLE configured to use a DRX cycle that is longer than the modification period acquires the updated system information immediately from the start of the next eDRX acquisition period. The UE applies the previously acquired system information until the UE acquires the new system information. The possible boundaries of modification for *SystemInformationBlockType1-BR* are defined by SFN values for which SFN mod 512 = 0 except for notification of ETWS/CMAS for which the eNB may change *SystemInformationBlockType1-BR* content at any time. For NB-IoT, the possible boundaries of modification for *SystemInformationBlockType1-NB* are defined by SFN values for which (H-SFN \* 1024 + SFN) mod 4096 = 0.



Figure 5.2.1.3-1: Change of system Information

The *Paging* message is used to inform UEs in RRC\_IDLE and UEs in RRC\_CONNECTED about a system information change. If the UE is in RRC\_CONNECTED or is not configured to use a DRX cycle longer than the modification period in RRC\_IDLE, and receives a *Paging* message including the *systemInfoModification*, it knows that the system information will change at the next modification period boundary. A UE in RRC\_IDLE that is configured to use a DRX cycle longer than the modification period, and receives in an eDRX acquisition period at least one *Paging* message including the *systemInfoModification-eDRX*, shall acquire the updated system information at the next eDRX acquisition period boundary. Although the UE may be informed about changes in system information, no further details are provided e.g. regarding which system information will change, except if *systemInfoValueTagSI* is received by BL UEs or UEs in CE.

In RRC\_CONNECTED, BL UEs or UEs inCEor NB-IoT UEs are not required to acquire system information except when T311 is running, or upon handover where the UE is only required to acquire the *MasterInformationBlock* in the target PCell, or for UEs in CE to receive ETWS/CMAS information, or upon expiry of T317 where the UE is required to acquire the *SystemInformationBlockType31* (*SystemInformationBlockType31-NB* in NB-IoT) and may acquire the *SystemInformationBlockType33* (*SystemInformationBlockType33-NB* in NB-IoT). In RRC\_IDLE, E-UTRAN may notify BL UEs or UEs inCEorNB-IoT UEs about SI update, ETWS and CMAS notification, and may notify BL UEs or UEs inCE about EAB modification and UAC modification, using Direct Indication information, as specified in 6.6 (or 6.7.5 in NB-IoT) and TS 36.212 [22].

NOTE 2: Upon system information change essential for BL UEs, UEs in CE, or NB-IoT UEs in RRC\_CONNECTED, E-UTRAN may initiate connection release.

NOTE 3: When acquiring SIB31(-NB) or SIB33(-NB) in RRC\_CONNECTED, UE may assume that the scheduling is unchanged.

*SystemInformationBlockType1* (or *MasterInformationBlock-NB/ MasterInformationBlock-TDD-NB* in NB-IoT) includes a value tag *systemInfoValueTag*, that indicates if a change has occurred in the SI messages. UEs may use *systemInfoValueTag*, e.g. upon return from out of coverage, to verify if the previously stored SI messages are still valid. *MasterInformationBlock* and RSS (if transmitted, see TS 36.211 [21]) may indicate using *systemInfoUnchanged-BR* that a change has not occurred in the SIB1-BR and SI messages of the current cell at least over the SI validity time, and the BL UEs or UEs in CE may use the *systemInfoUnchanged-BR*, e.g. upon return from out of coverage, to verify if the previously stored SIB1-BR and SI messages are still valid. Additionally, for other than BL UEs or UEs in CE or NB-IoT UEs, the UE considers stored system information to be invalid after 3 hours from the moment it was successfully confirmed as valid, unless specified otherwise. BL UE or UE in CE considers stored system information to be invalid after 24 hours from the moment it was successfully confirmed as valid, unless the UE is configured by parameter *si-ValidityTime* to consider stored system information to be invalid 3 hours after validity confirmation. NB-IoT UE considers stored system information to be invalid after 24 hours from the moment it was successfully confirmed as valid. If a BL UE, UE in CE or NB-IoT UE in RRC\_CONNECTED state considers the stored system information invalid, the UE shall continue using the stored system information while in RRC\_CONNECTED state in the serving cell.

For BL UEs or UEs in CE or NB-IoT UEs, the change of specific SI message can additionally be indicated by a SI message specific value tag *systemInfoValueTagSI.* If *systemInfoValueTag* included in the *SystemInformationBlockType1-BR* (or *MasterInformationBlock-NB/ MasterInformationBlock-TDD-NB* in NB-IoT) is different from the one of the stored system information and if *systemInfoValueTagSI* is included in the *SystemInformationBlockType1-BR* (or *SystemInformationBlockType1-NB* in NB-IoT)for a specific SI messageand is different from the stored one, the UE shall consider this specific SI message to be invalid. If only *systemInfoValueTag* is included and is different from the stored one, the BL UE or UE in CE should consider any stored system information except *SystemInformationBlockType10*, *SystemInformationBlockType11*, *SystemInformationBlockType12,* *SystemInformationBlockType14,* *SystemInformationBlockType25*, *SystemInformationBlockType31* and *SystemInformationBlockType33* to be invalid; the NB-IoT UE should consider any stored system information except *SystemInformationBlockType14-NB*, *SystemInformationBlockType31-NB* and *SystemInformationBlockType33-NB* to be invalid.

On MBMS-dedicated cell and on FeMBMS/Unicast-mixed cell, the change of system information and ETWS/CMAS notification is indicated by using Direct Indication FeMBMS defined in 6.6a. The modification periodicity follows MCCH modification periodicity as defined in 5.8.1.3.

E-UTRAN may not update *systemInfoValueTag* upon change of some system information e.g. ETWS information, CMAS information, RLOS indication (i.e., *rlos-Enabled*), regularly changing parameters like time information (*SystemInformationBlockType8*, *SystemInformationBlockType16,* *hyperSFN-MSB* in *SystemInformationBlockType1-NB*), EAB and AB parameters, UAC parameters, positioning system information blocks, or satellite assistance information. Similarly, E-UTRAN may not include the *systemInfoModification* within the *Paging* message upon change of some system information.

NOTE 4: UE connected to NTN is expected to re-acquire SIB32(-NB) based on its own decision regardless of *systemInfoValueTag* change.

NOTE X: UE in RRC\_IDLE may acquire SIB33(-NB) at the time indicated by *t-ModeSwitchingNeigh* in SIB33(-NB) for the updated *sf-OperationModeNeigh* and *t-ModeSwitchingNeigh*, if any.

The UE that is not configured to use a DRX cycle longer than the modification period verifies that stored system information remains valid by either checking *systemInfoValueTag* in *SystemInformationBlockType1* (or *MasterInformationBlock-NB/ MasterInformationBlock-TDD-NB* in NB-IoT) after the modification period boundary,or attempting to find the *systemInfoModification* indication at least *modificationPeriodCoeff* times during the modification period in case no paging is received, in every modification period*.* If no paging message is received by the UE during a modification period, the UE may assume that no change of system information will occur at the next modification period boundary. If UE in RRC\_CONNECTED, during a modification period, receives one paging message, it may deduce from the presence/ absence of *systemInfoModification* whether a change of system information other than ETWS information, CMAS information, EAB and UAC parameters will occur in the next modification period or not.

When the RRC\_IDLE UE is configured with a DRX cycle that is longer than the modification period, and at least one modification period boundary has passed since the UE last verified validity of stored system information, the UE verifies that stored system information remains valid by checking the *systemInfoValueTag* before establishing or resuming an RRC connection.

ETWS and/or CMAS capable UEs in RRC\_CONNECTED, other than BL UEs and UEs in CE and NB-IoT UEs, shall attempt to read paging at least once every *defaultPagingCycle* to check whether ETWS and/or CMAS notification is present or not.

Next Change

#### 5.2.2.7 Actions upon reception of the *SystemInformationBlockType1* message

Upon receiving the *SystemInformationBlockType1* or *SystemInformationBlockType1-BR* either via broadcast or via dedicated signalling, the UE shall:

1> if the upper layers indicate the selected core network type as 5GC:

2> if the *cellAccessRelatedInfoList-5GC* contains an entry with the *plmn-Identity* or *plmn-Index* of the selected PLMN:

3> in the remainder of the procedures use *plmn-IdentityList*, *trackingAreaCode*, and *cellIdentity* for the cell as received in the corresponding *cellAccessRelatedInfoList-5GC* containing the selected PLMN;

1> else if the *cellAccessRelatedInfoList* contains an entry with the *PLMN-Identity* of the selected PLMN:

2> in the remainder of the procedures use *plmn-IdentityList*, *trackingAreaCode*, *trackingAreaList* and *cellIdentity* for the cell as received in the corresponding *cellAccessRelatedInfoList* containing the selected PLMN;

1> if in RRC\_IDLE or in RRC\_CONNECTED while T311 is running; and

1> if the UE is a category 0 UE according to TS 36.306 [5]; and

1> if *category0Allowed* is not included in *SystemInformationBlockType1*:

2> consider the cell as barred in accordance with TS 36.304 [4];

1> if the access is for NTN and the UE supports the Store and Forward operation:

2> indicate to upper layers that the cell is operating in Store and Forward mode, if *sf-OperationMode* is present;

2> indicate to upper layers that the cell is operating in normal mode, if *sf-OperationMode* is absent;

1> if in RRC\_CONNECTED while T311 is not running, and the UE supports multi-band cells as defined by bit 31 in *featureGroupIndicators*:

2> disregard the *freqBandIndicator* and *multiBandInfoList*, ifreceived, while in RRC\_CONNECTED;

2> forward the *cellIdentity* to upper layers;

2> forward the *trackingAreaCode* to upper layers;

2> forward the *trackingAreaList* to upper layers, if present;

1> else:

2> if UE is IAB-MT and if *iab-Support* is not provided for the selected PLMN nor the registered PLMN nor PLMN of the equivalent PLMN list:

3> consider the cell as barred for IAB-MT in accordance with TS 36.304 [4];

3> perform barring as if *intraFreqReselection* is set to allowed, and as if the *csg-Indication* is set to *FALSE*;

2> else:

3> if the frequency band indicated in the *freqBandIndicator* or *freqBandIndicatorAerial* is part of the frequency bands supported by the UE and it is not a downlink only band; or

3> if the UE supports *multiBandInfoList,* and if one or more of the frequency bands indicated in the *multiBandInfoList* or *multiBandInfoListAerial* are part of the frequency bands supported by the UE and they are not downlink only bands:

4> forward the *cellIdentity* to upper layers;

4> forward the *trackingAreaCode* to upper layers;

4> forward the *trackingAreaList* to upper layers, if present;

4> forward the PLMN identity to upper layers;

4> if in RRC\_INACTIVE and the forwarded information does not trigger message transmission by upper layers:

5> if the serving cell does not belong to the configured *ran-NotificationAreaInfo*:

6> initiate an RNA update as specified in 5.3.17.2;

4> forward the *ims-EmergencySupport* to upper layers, if present;

4> forward the *eCallOverIMS-Support* to upper layers, if present;

4> if the UE is capable of 5G NAS:

5> forward the *ims-EmergencySupport5GC* to upper layers, if present;

5> forward the *eCallOverIMS-Support5GC* to upper layers, if present;

5> forward *cp-CIoT-5GS-Optimisation* to upper layers, if present for the selected PLMN;

5> forward *up-CIoT-5GS-Optimisation* to upper layers, if present for the selected PLMN;

4> if the UE is aerial UE and for the frequency band selected by the UE (from *freqBandIndicatorAerial* or *multiBandInfoListAerial*), the *freqBandInfoAerial* or the *multiBandInfoListAerial* is present and the UE capable of *multiNS-Pmax* does not support any of the *additionalSpectrumEmission* in the *NS-PmaxListAerial* within the *freqBandInfoAerial* or *multiBandInfoListAerial*:

5> consider the cell as barred in accordance with TS 36.304 [4];

5> perform barring as if *intraFreqReselection* is set to *notAllowed*,and as if the *csg-Indication* is set to *FALSE*, upon which the procedure ends;

4> else if the UE is aerial UE and for the frequency band selected by the UE (from *freqBandIndicatorAerial* or *multiBandInfoListAerial*), the *freqBandInfoAerial* or the *multiBandInfoListAerial* is present and the UE capable of *multiNS-Pmax* supports at least one *additionalSpectrumEmission* in the *NS-PmaxListAerial* within the *freqBandInfoAerial* or *multiBandInfoListAerial*:

5> apply the first listed *additionalSpectrumEmission* which it supports among the values included in *NS-PmaxListAerial* within *freqBandInfoAerial* or *multiBandInfoListAerial*;

5> if the *additionalPmax* is present in the same entry of the selected *additionalSpectrumEmission* within *NS-PmaxListAerial*:

6> apply the *additionalPmax*;

5> else:

6> apply the *p-Max*;

4> else if, for the frequency band selected by the UE (from *freqBandIndicator* or *multiBandInfoList*), the *freqBandInfo* or the *multiBandInfoList-v10j0* is present and the UE capable of *multiNS-Pmax* supports at least one *additionalSpectrumEmission* in the *NS-PmaxList* within the *freqBandInfo* or *multiBandInfoList-v10j0*:

5> apply the first listed *additionalSpectrumEmission* which it supports among the values included in *NS-PmaxList* within *freqBandInfo* or *multiBandInfolist-v10j0*;

5> if the *additionalPmax* is present in the same entry of the selected *additionalSpectrumEmission* within *NS-PmaxList*:

6> apply the *additionalPmax*;

5> else:

6> apply the *p-Max*;

4> else:

5> apply the *additionalSpectrumEmission* in *SystemInformationBlockType2* and the *p-Max*;

3> else:

4> consider the cell as barred in accordance with TS 36.304 [4]; and

4> perform barring as if *intraFreqReselection* is set to *notAllowed*,and as if the *csg-Indication* is set to *FALSE*;

Upon receiving the *SystemInformationBlockType1-NB*, the UE shall:

1> if the upper layers indicate the selected core network type as 5GC:

2> in the remainder of the procedures use *plmn-IdentityList*, *trackingAreaCode*, and *cellIdentity* for the cell as received in the *cellAccessRelatedInfo-5GC*;

1> else:

2> in the remainder of the procedures use *plmn-IdentityList*, *trackingAreaCode*, *trackingAreaList* and *cellIdentity* for the cell as received in the *cellAccessRelatedInfo*;

1> if the frequency band indicated in the *freqBandIndicator* is part of the frequency bands supported by the UE; or

1> if one or more of the frequency bands indicated in the *multiBandInfoList* are part of the frequency bands supported by the UE:

2> forward the *cellIdentity* to upper layers;

2> forward the *trackingAreaCode* to upper layers;

2> forward the *trackingAreaList* to upper layers, if present;

2> if the access is for NTN and the UE supports the Store and Forward operation:

3> indicate to upper layers that the cell is operating in Store and Forward mode, if *sf-OperationMode* is present;

3> indicate to upper layers that the cell is operating in normal mode, if *sf-OperationMode* is absent;

2> if *attachWithoutPDN-Connectivity* is received for the selected PLMN:

3> forward the a*ttachWithoutPDN-Connectivity* to upper layers;

2> else:

3> indicate to upper layers that *attachWithoutPDN-Connectivity* is not present;

2> if the UE is capable of 5G NAS:

3> forward *ng-U-DataTransfer* to upper layers, if present for the selected PLMN;

3> forward *up-CIoT-5GS-Optimisation* to upper layers, if present for the selected PLMN;

2> if, for the frequency band selected by the UE (from *freqBandIndicator* or *multiBandInfoList*), the *freqBandInfo* is present and the UE capable of *multiNS-Pmax* supports at least one *additionalSpectrumEmission* in the *NS-PmaxList* within the *freqBandInfo*:

3> apply the first listed *additionalSpectrumEmission* which it supports among the values included in *NS-PmaxList* within *freqBandInfo*;

3> if the *additionalPmax* is present in the same entry of the selected *additionalSpectrumEmission* within *NS-PmaxList*:

4> apply the *additionalPmax*;

3> else:

4> apply the *p-Max*;

2> else:

3> apply the *additionalSpectrumEmission* in *SystemInformationBlockType2-NB* and the *p-Max*;

1> else:

2> consider the cell as barred in accordance with TS 36.304 [4]; and

2> perform barring as if *intraFreqReselection* is set to *notAllowed*.

No UE requirements related to the contents of *SystemInformationBlockType1-MBMS* apply other than those specified elsewhere e.g. within procedures using the concerned system information, and/ or within the corresponding field descriptions.

Next Change

#### 5.3.3.1b Conditions for initiating EDT

A BL UE, UE in CE or NB-IoT UE can initiate EDT using the random access procedure when all of the following conditions are fulfilled:

1> if the UE is connected to EPC:

2> for CP-EDT, the upper layers request establishment of an RRC connection, the UE supports CP-EDT, and *SystemInformationBlockType2 (SystemInformationBlockType2-NB* in NB-IoT) includes *cp-EDT*; or

2> for UP-EDT, the upper layers request resumption of an RRC connection, the UE supports UP-EDT, *SystemInformationBlockType2 (SystemInformationBlockType2-NB* in NB-IoT) includes *up-EDT*, and the UE has a stored value of the *nextHopChainingCount* provided in the *RRCConnectionRelease* message with suspend indication during the preceding suspend procedure;

1> else if the UE is connected to 5GC:

2> for CP-EDT, the upper layers request establishment of an RRC connection, the UE connected to 5GC supports CP-EDT, and *SystemInformationBlockType2 (SystemInformationBlockType2-NB* in NB-IoT) includes *cp-EDT-5GC*; or

2> for UP-EDT, the upper layers request resumption of an RRC connection, the UE connected to 5GC supports UP-EDT, *SystemInformationBlockType2 (SystemInformationBlockType2-NB* in NB-IoT) includes *up-EDT-5GC*, and the UE has a stored value of the *nextHopChainingCount* provided in the *RRCConnectionRelease* message with suspend indication during the preceding suspend procedure;

1> the establishment or resumption request is for mobile originating calls and the establishment cause is *mo-Data* or *mo-ExceptionData* or *delayTolerantAccess*; or

1> the establishment or resumption request is for mobile terminating calls, the UE has a stored *mt-EDT* indication and the establishment cause is *mt-Access*;

1> the establishment or resumption request is suitable for EDT as specified in TS 36.300 [9], clause 7.3b.1;

1> *SystemInformationBlockType2 (SystemInformationBlockType2-NB* in NB-IoT) includes *edt-Parameters*;

1> for mobile originating calls, the size of the resulting MAC PDU including the total UL data is expected to be smaller than or equal to the TBS signalled in *edt-TBS* as specified in TS 36.321 [6], clause 5.1.1;

1> EDT fallback indication has not been received from lower layers for this establishment or resumption procedure;

In NTN, a BL UE, UE in CE mode A or NB-IoT UE can initiate EDT using the CB-Msg3-EDT procedure when all of the following conditions are fulfilled:

1> for CP-EDT, the upper layers request establishment of an RRC connection, the UE supports CB-Msg3-EDT, *SystemInformationBlockType2(-NB)* includes *cp-CB-Msg3-EDT* and *SystemInformationBlockType2* includes *cb-Msg3-ConfigSIB (SystemInformationBlockType2-NB* and/or *SystemInformationBlockType22-NB* includes *cb-Msg3-ConfigSIB-NB* in NB-IoT); or,

1> for UP-EDT, the upper layers request resumption of an RRC connection, the UE supports CB-Msg3-EDT, *SystemInformationBlockType2(-NB)* includes *up-CB-Msg3-EDT, SystemInformationBlockType2* includes *cb-Msg3-ConfigSIB (SystemInformationBlockType2-NB* and/or *SystemInformationBlockType22-NB* includes *cb-Msg3-ConfigSIB-NB* in NB-IoT), and the UE has a stored value of the *nextHopChainingCount* provided in the *RRCConnectionRelease* message with suspend indication during the preceding suspend procedure;

1> the establishment cause is *mo-Data* or *mo-ExceptionData* or *delayTolerantAccess*; or the UE has a stored *mt-EDT* indication and the establishment cause is *mt-Access*;

1> the establishment or resumption request is suitable for CB-Msg3-EDT as specified in TS 36.300 [9], clause 7.3b.1;

1> the measured RSRP is larger than or equal to the minimum RSRP threshold configured in *cb-Msg3-MinRSRP-Threshold* (*cb-Msg3-MinRSRP-Threshold-NB* in NB-IoT);

1> the size of the resulting MAC PDU including the total UL data is expected to be smaller than or equal to the TBS signalled in *cb-Msg3-TBS* (*cb-Msg3-TBS-NB* in NB-IoT).

NOTE 1: Upper layers request or resume an RRC connection. The interaction with NAS is up to UE implementation.

NOTE 2: It is up to UE implementation how the UE determines whether the size of UL data is suitable for EDT.

NOTE 3: It is up to UE implementation to decide in which order the conditions to trigger the different procedures are met.

Next Change

#### 5.3.3.2 Initiation

The UE initiates the procedure when upper layers request establishment or resume of an RRC connection while the UE is in RRC\_IDLE or when upper layers request resume of an RRC connection or RRC layer requests resume of an RRC connection for, e.g. RNAU or reception of RAN paging while the UE is in RRC\_INACTIVE.

Except for NB-IoT, upon initiation of the procedure, if the UE is connected to EPC, the UE shall:

1> if *SystemInformationBlockType2* includes *ac-BarringPerPLMN-List* and the *ac-BarringPerPLMN-List* contains an *AC-BarringPerPLMN* entry with the *plmn-IdentityIndex* corresponding to the PLMN selected by upper layers (see TS 23.122 [11], TS 24.301 [35]):

2> select the *AC-BarringPerPLMN* entry with the *plmn-IdentityIndex* corresponding to the PLMN selected by upper layers;

2> in the remainder of this procedure, use the selected *AC-BarringPerPLMN* entry (i.e. presence or absence of access barring parameters in this entry) irrespective of the common access barring parameters included in *SystemInformationBlockType2;*

1> else

2> in the remainder of this procedure use the common access barring parameters (i.e. presence or absence of these parameters) included in *SystemInformationBlockType2;*

1> if *SystemInformationBlockType2* contains *acdc-BarringPerPLMN-List* and the *acdc-BarringPerPLMN-List* contains an *ACDC-BarringPerPLMN* entry with the *plmn-IdentityIndex* corresponding to the PLMN selected by upper layers (see TS 23.122 [11], TS 24.301 [35]):

2> select the *ACDC-BarringPerPLMN* entry with the *plmn-IdentityIndex* corresponding to the PLMN selected by upper layers;

2> in the remainder of this procedure, use the selected *ACDC-BarringPerPLMN* entry for ACDC barring check (i.e. presence or absence of access barring parameters in this entry) irrespective ofthe *acdc-BarringForCommon* parameters included in *SystemInformationBlockType2*;

1> else:

2> in the remainder of this procedure use the *acdc-BarringForCommon* (i.e. presence or absence of these parameters) included in *SystemInformationBlockType2* for ACDC barring check;

1> if upper layers indicate that the RRC connection is subject to EAB (see TS 24.301 [35]):

2> if the result of the EAB check, as specified in 5.3.3.12, is that access to the cell is barred:

3> inform upper layers about the failure to establish the RRC connection or failure to resume the RRC connection with suspend indication and that EAB is applicable, upon which the procedure ends;

1> if upper layers indicate that the RRC connection is subject to ACDC (see TS 24.301 [35]), *SystemInformationBlockType2* contains *BarringPerACDC-CategoryList*, and *acdc-HPLMNonly* indicates that ACDC is applicable for the UE:

2> if the *BarringPerACDC-CategoryList* contains a *BarringPerACDC-Category* entry corresponding to the ACDC category selected by upper layers:

3> select the *BarringPerACDC-Category* entry corresponding to the ACDC category selected by upper layers;

2> else:

3> select the last *BarringPerACDC-Category* entry in the *BarringPerACDC-CategoryList*;

2> stop timer T308, if running;

2> perform access barring check as specified in 5.3.3.13, using T308 as "Tbarring" and *acdc-BarringConfig* in the *BarringPerACDC-Category* as "ACDC barring parameter";

2> if access to the cell is barred:

3> inform upper layers about the failure to establish the RRC connection or failure to resume the RRC connection with suspend indication and that access barring is applicable due to ACDC, upon which the procedure ends;

1> else if the UE is establishing the RRC connection for mobile terminating calls:

2> if timer T302 is running:

3> inform upper layers about the failure to establish the RRC connection or failure to resume the RRC connection with suspend indication and that access barring for mobile terminating calls is applicable, upon which the procedure ends;

1> else if the UE is establishing the RRC connection for emergency calls:

2> if *SystemInformationBlockType2* includes the *ac-BarringInfo*:

3> if the *ac-BarringForEmergency* is set to *TRUE*:

4> if the UE has one or more Access Classes, as stored on the USIM, with a value in the range 11..15, which is valid for the UE to use according to TS 22.011 [10] and TS 23.122 [11]:

NOTE 1: ACs 12, 13, 14 are only valid for use in the home country and ACs 11, 15 are only valid for use in the HPLMN/ EHPLMN.

5> if the *ac-BarringInfo* includes *ac-BarringForMO-Data*, and for all of these valid Access Classes for the UE, the corresponding bit in the *ac-BarringForSpecialAC* contained in *ac-BarringForMO-Data* is set to *one*:

6> consider access to the cell as barred;

4> else:

5> consider access to the cell as barred;

2> if access to the cell is barred:

3> inform upper layers about the failure to establish the RRC connection or failure to resume the RRC connection with suspend indication, upon which the procedure ends;

1> else if the UE is establishing the RRC connection for mobile originating calls:

2> perform access barring check as specified in 5.3.3.11, using T303 as "Tbarring" and *ac-BarringForMO-Data* as "AC barring parameter";

2> if access to the cell is barred:

3> if *SystemInformationBlockType2* includes *ac-BarringForCSFB* or the UE does not support CS fallback:

4> inform upper layers about the failure to establish the RRC connection or failure to resume the RRC connection with suspend indication and that access barring for mobile originating calls is applicable, upon which the procedure ends;

3> else (*SystemInformationBlockType2* does not include *ac-BarringForCSFB* and the UE supports CS fallback):

4> if timer T306 is not running, start T306 with the timer value of T303;

4> inform upper layers about the failure to establish the RRC connection or failure to resume the RRC connection with suspend indication and that access barring for mobile originating calls and mobile originating CS fallback is applicable, upon which the procedure ends;

1> else if the UE is establishing the RRC connection for mobile originating signalling:

2> perform access barring check as specified in 5.3.3.11, using T305 as "Tbarring" and *ac-BarringForMO-Signalling* as "AC barring parameter";

2> if access to the cell is barred:

3> inform upper layers about the failure to establish the RRC connection or failure to resume the RRC connection with suspend indication and that access barring for mobile originating signalling is applicable, upon which the procedure ends;

1> else if the UE is establishing the RRC connection for mobile originating CS fallback:

2> if *SystemInformationBlockType2* includes *ac-BarringForCSFB*:

3> perform access barring check as specified in 5.3.3.11, using T306 as "Tbarring" and *ac-BarringForCSFB* as "AC barring parameter";

3> if access to the cell is barred:

4> inform upper layers about the failure to establish the RRC connection or failure to resume the RRC connection with suspend indication and that access barring for mobile originating CS fallback is applicable, due to *ac-BarringForCSFB*, upon which the procedure ends;

2> else:

3> perform access barring check as specified in 5.3.3.11, using T306 as "Tbarring" and *ac-BarringForMO-Data* as "AC barring parameter";

3> if access to the cell is barred:

4> if timer T303 is not running, start T303 with the timer value of T306;

4> inform upper layers about the failure to establish the RRC connection or failure to resume the RRC connection with suspend indication and that access barring for mobile originating CS fallback and mobile originating calls is applicable, due to *ac-BarringForMO-Data*, upon which the procedure ends;

1> else if the UE is establishing the RRC connection for mobile originating MMTEL voice, mobile originating MMTEL video, mobile originating SMSoIP or mobile originating SMS; or

1> if the UE is establishing the RRC connection after EPS fallback for IMS voice (see TS 23.502 [102]) was triggered in NR via *RRCRelease* with *voiceFallbackIndication* (see TS 38.331 [82]):

2> if the UE is establishing the RRC connection for mobile originating MMTEL voice and *SystemInformationBlockType2* includes *ac-BarringSkipForMMTELVoice*; or

2> if the UE is establishing the RRC connection for mobile originating MMTEL video and *SystemInformationBlockType2* includes *ac-BarringSkipForMMTELVideo*; or

2> if the UE is establishing the RRC connection for mobile originating SMSoIP or SMS and *SystemInformationBlockType2* includes *ac-BarringSkipForSMS*:

3> consider access to the cell as not barred;

2> else:

3> if *establishmentCause* received from higher layers is set to *mo-Signalling* (including the case that *mo-Signalling* is replaced by *highPriorityAccess* according to TS 24.301 [35] or by *mo-VoiceCall* according to the clause 5.3.3.3)*:*

4> perform access barring check as specified in 5.3.3.11, using T305 as "Tbarring" and *ac-BarringForMO-Signalling* as "AC barring parameter";

4> if access to the cell is barred:

5> inform upper layers about the failure to establish the RRC connection or failure to resume the RRC connection with suspend indication and that access barring for mobile originating signalling is applicable, upon which the procedure ends;

3> if *establishmentCause* received from higher layers is set to *mo-Data* (including the case that *mo-Data* is replaced by *highPriorityAccess* according to TS 24.301 [35] or by *mo-VoiceCall* according to the clause 5.3.3.3):

4> perform access barring check as specified in 5.3.3.11, using T303 as "Tbarring" and *ac-BarringForMO-Data* as "AC barring parameter";

4> if access to the cell is barred:

5> if *SystemInformationBlockType2* includes *ac-BarringForCSFB* or the UE does not support CS fallback:

6> inform upper layers about the failure to establish the RRC connection or failure to resume the RRC connection with suspend indication and that access barring for mobile originating calls is applicable, upon which the procedure ends;

5> else (*SystemInformationBlockType2* does not include *ac-BarringForCSFB* and the UE supports CS fallback):

6> if timer T306 is not running, start T306 with the timer value of T303;

6> inform upper layers about the failure to establish the RRC connection or failure to resume the RRC connection with suspend indication and that access barring for mobile originating calls and mobile originating CS fallback is applicable, upon which the procedure ends;

Upon initiation of the procedure, if the UE is connected to 5GC, the UE shall:

1> if the upper layers provide an Access Category and one or more Access Identities upon requesting establishment of an RRC connection:

2> perform the unified access control procedure as specified in 5.3.16 using the Access Category and Access Identities provided by upper layers;

3> if the access attempt is barred, the procedure ends;

1> if the resumption of the RRC connection is triggered by response to NG-RAN paging:

2> select '0' as the Access Category;

2> perform the unified access control procedure as specified in 5.3.16 using the selected Access Category and one or more Access Identities provided by upper layers;

3> if the access attempt is barred, the procedure ends;

1> else if the resumption of the RRC connection is triggered by upper layers:

2> if the upper layers provide an Access Category and one or more Access Identities:

3> perform the unified access control procedure as specified in 5.3.16 using the Access Category and Access Identities provided by upper layers;

4> if the access attempt is barred, the procedure ends;

2> set the *resumeCause* in accordance with the information received from upper layers;

1> else if the resumption of the RRC connection is triggered due to an RNAU:

2> if an emergency service is ongoing:

3> select '2' as the Access Category;

3> set the *resumeCause* to *emergency*;

2> else:

3> select '8' as the Access Category;

2> perform the unified access control procedure as specified in 5.3.16 using the selected Access Category and one or more Access Identities to be applied as specified in TS 24.501 [95];

3> if the access attempt is barred:

4> set the variable *pendingRnaUpdate* to 'TRUE';

4> the procedure ends;

Except for NB-IoT, upon initiating the procedure, if connected to EPC or 5GC, the UE shall:

1> if the UE is resuming an RRC connection from a suspended RRC connection or from RRC\_INACTIVE:

2> if the UE was configured with (NG)EN-DC:

3> if the UE does not support maintaining SCG configuration upon connection resumption:

4> perform MR-DC release, as specified in TS 38.331 [82], clause 5.3.5.10;

4> release *p-MaxEUTRA*, if configured;

4> release *p-MaxUE-FR1*, if configured;

4> release *tdm-PatternConfig* or *tdm-PatternConfig2*, if configured;

3> release *otherConfig* associated with the SCG, if configured;

3> stop timers T346a, T346b, T346c, T346d and T346e associated with the SCG (see TS 38.331 [82], clause 7.1.1), if running;

2> if the UE does not support maintaining the MCG SCell configurations upon connection resumption:

3> release the MCG SCell(s), if configured, in accordance with 5.3.10.3a;

2> release *powerPrefIndicationConfig*, if configured and stop timer T340, if running;

2> release *reportProximityConfig* and clear any associated proximity status reporting timer;

2> release *obtainLocationConfig*, if configured;

2> release *bt-NameListConfig*, if configured;

2> release *wlan-NameListConfig*, if configured;

2> release *measUncomBarPre*, if configured;

2> release *idc-Config*, if configured;

2> release *sps-AssistanceInfoReport*, if configured;

2> release *scg-DeactivationPreferenceConfig*, if configured and stop timer T346, if running;

2> release *measSubframePatternPCell*, if configured;

2> if the UE was configured with DC:

3> release the entire SCG configuration, if configured, except for the DRB configuration (as configured by *drb-ToAddModListSCG*);

2> release *naics-Info* for the PCell, if configured;

2> release the LWA configuration, if configured, as described in 5.6.14.3;

2> release the LWIP configuration, if configured, as described in 5.6.17.3;

2> release *bw-PreferenceIndicationTimer*, if configured and stop timer T341, if running;

2> release *delayBudgetReportingConfig*, if configured and stop timer T342, if running;

2> release *ailc-BitConfig*, if configured;

2> release *uplinkDataCompression*, if configured;

2> release *overheatingAssistanceConfig* and *overheatingAssistanceConfigForSCG*, if configured and stop timer T345, if running;

NOTE 1a: The parameters and configurations are released from the UE Inactive AS context if the UE is resuming an RRC connection from RRC\_INACTIVE.

1> if the UE is establishing or resuming an RRC connection from a suspended RRC connection:

2> if the UE has a stored *pur-Config* and the cell is different from the cell where *pur-Config* was provided:

3> if *pur-TimeAlignmentTimer* is configured, indicate to lower layers that *pur-TimeAlignmentTimer* is released;

3> release *pur-Config*;

3> discard previously stored *pur-Config*;

1> apply the default physical channel configuration as specified in 9.2.4;

1> apply the default semi-persistent scheduling configuration as specified in 9.2.3;

1> apply the default MAC main configuration as specified in 9.2.2;

1> apply the CCCH configuration as specified in 9.1.1.2;

1> apply the *timeAlignmentTimerCommon* included in *SystemInformationBlockType2*;

1> if UE supports timing advance reporting and *ta-Report* is included in *SystemInformationBlockType2* and the UE is not performing CB-Msg3-EDT as specified in 5.3.3.3b:

2> instruct the associated MAC entity to trigger Timing Advance reporting;

1> start timer T300;

1> if the UE is resuming an RRC connection from a suspended RRC connection:

2> initiate transmission of the *RRCConnectionResumeRequest* message in accordance with 5.3.3.3a;

1> else if the UE is resuming an RRC connection from RRC\_INACTIVE:

2> set the variable *pendingRnaUpdate* to 'FALSE';

2> initiate transmission of the *RRCConnectionResumeRequest* message in accordance with 5.3.3.3a;

1> else:

2> if stored, discard the UE AS context, UE Inactive AS context and *resumeIdentity*;

2> release *rrc-InactiveConfig*, if configured;

2> if the UE is initiating CP-EDT in accordance with conditions in 5.3.3.1b; or

2> if the UE is initiating CP transmission using PUR in accordance with conditions in 5.3.3.1c:

3> initiate transmission of the *RRCEarlyDataRequest* message in accordance with 5.3.3.3b;

2> else:

3> initiate transmission of the *RRCConnectionRequest* message in accordance with 5.3.3.3;

1> if stored, discard *mt-EDT*;

NOTE 2: Upon initiating the connection establishment procedure, the UE is not required to ensure it maintains up to date system information applicable only for UEs in RRC\_IDLE state or UEs in RRC\_INACTIVE. However, the UE needs to perform system information acquisition upon cell re-selection.

For NB-IoT, upon initiation of the procedure, the UE shall:

1> if theUEis connected to EPC:

2> if theUEis establishing or resuming the RRC connection for mobile originating exception data;or

2> if theUEis establishing or resuming the RRC connection for mobile originating data;or

2> if theUEis establishing or resuming the RRC connection for delay tolerant access;or

2> if theUEis establishing or resuming the RRC connection for mobile originating signalling;

3> perform access barring check as specified in 5.3.3.14;

3> if access to the cell is barred:

4> inform upper layers about the failure to establish the RRC connection or failure to resume the RRC connection with suspend indication and that access barring is applicable, upon which the procedure ends;

1> if the UE is connected to 5GC:

2> if the Access Category provided by the upper layers is different from '0':

3> perform access barring check for per-NRSRP barring as specified in 5.3.3.14;

3> if access to the cell is barred:

4> inform upper layers about the failure to establish the RRC connection or failure to resume the RRC connection with suspend indication, upon which the procedure ends;

3> else:

4> perform the unified access control procedure as specified in 5.3.16 using the Access Category and Access Identities provided by upper layers;

4> if the access attempt is barred, the procedure ends;

1> if the UE is establishing or resuming an RRC connection:

2> if the UE has a stored *pur-Config* and the cell is different from the cell where *pur-Config* was provided:

3> if *pur-TimeAlignmentTimer* is configured, indicate to lower layers that *pur-TimeAlignmentTimer* is released;

3> release *pur-Config*;

3> discard previously stored *pur-Config*;

2> release *obtainLocationNB*, if configured;

1> apply the default physical channel configuration as specified in 9.2.4;

1> apply the default MAC main configuration as specified in 9.2.2;

1> apply the CCCH configuration as specified in 9.1.1.2;

1> if UE supports timing advance reporting and *ta-Report* is included in *SystemInformationBlockType2-NB* and the UE is not performing CB-Msg3-EDT as specified in 5.3.3.3b:

2> instruct the associated MAC entity to trigger Timing Advance reporting;

1> start timer T300;

1> if the UE is establishing an RRC connection:

2> if stored, discard the UE AS context and *resumeIdentity*;

2> if the UE is initiating CP-EDT in accordance with conditions in 5.3.3.1b; or

2> if the UE is initiating CP transmission using PUR in accordance with conditions in 5.3.3.1c:

3> initiate transmission of the *RRCEarlyDataRequest* message in accordance with 5.3.3.3b;

2> else:

3> initiate transmission of the *RRCConnectionRequest* message in accordance with 5.3.3.3;

1> else if the UE is resuming an RRC connection:

2> release *schedulingRequestConfig*, if configured;

2> initiate transmission of the *RRCConnectionResumeRequest* message in accordance with 5.3.3.3a;

1> if stored, discard *mt-EDT*;

NOTE 3: Upon initiating the connection establishment or resumption procedure, the UE is not required to ensure it maintains up to date system information applicable only for UEs in RRC\_IDLE state. However, the UE needs to perform system information acquisition upon cell re-selection.

NOTE 4: For EDT and transmission using PUR, upon initiating the connection establishment or resumption procedure, it is up to UE implementation whether to continue cell re-selection related measurements as well as cell re-selection evaluation and, if the conditions for cell re-selection are fulfilled, whether to perform cell re-selection as specified in 5.3.3.5.

Next Change

#### 5.3.3.3a Actions related to transmission of *RRCConnectionResumeRequest* message

If the UE is resuming the RRC connection from a suspended RRC connection, the UE shall set the contents of *RRCConnectionResumeRequest* message as follows:

1> if the UE is a NB-IoT UE; or

1> if the UE is initiating UP-EDT for mobile originating calls in accordance with conditions in 5.3.3.1b; or

1> if the UE is initiating UP transmission using PUR in accordance with conditions in 5.3.3.1c; or

1> if field *useFullResumeID* is signalled in *SystemInformationBlockType2*:

2> if the UE connected to 5GC is a BL UE or UE in CE:

3> set the *fullI-RNTI* to the stored *fullI-RNTI*;

2> else:

3> set the *resumeID* to the stored *resumeIdentity*;

1> else:

2> if the UE connected to 5GC is a BL UE or UE in CE:

3> set the *shortI-RNTI* to the stored *shortI-RNTI*;

2> else:

3> set the *truncatedResumeID* to include bits in bit position 9 to 20 and 29 to 40 from the left in the stored *resumeIdentity*.

1> if the UE is resuming the RRC connection after release with redirect with *mpsPriorityIndication*:

2> set the *resumeCause* to *highPriorityAccess*;

1> else if the UE supports *mo-VoiceCall* establishment cause and UE is resuming the RRC connection for mobile originating MMTEL voice and *SystemInformationBlockType2* includes *voiceServiceCauseIndication* and the establishment cause received from upper layers is not set to *highPriorityAccess*:

2> set the *resumeCause* to *mo-VoiceCall*;

1> else if the UE supports *mo-VoiceCall* establishment cause for mobile originating MMTEL video and UE is resuming the RRC connection for mobile originating MMTEL video and *SystemInformationBlockType2* includes *videoServiceCauseIndication* and the establishment cause received from upper layers is not set to *highPriorityAccess*:

2> set the *resumeCause* to *mo-VoiceCall*;

1> else if the UE is initiating UP-EDT for mobile terminating calls in accordance with conditions in 5.3.3.1b:

2> set the *resumeCause* to *mt-EDT*;

1> else:

2> set the *resumeCause* in accordance with the information received from upper layers;

1> set the *shortResumeMAC-I* to the 16 least significant bits of the MAC-I calculated:

2> over the ASN.1 encoded as per clause 8 (i.e., a multiple of 8 bits) *VarShortResumeMAC-Input* (or *VarShortResumeMAC-Input-NB* in NB-IoT);

2> with the KRRCint key and the previously configured integrity protection algorithm; and

2> with all input bits for COUNT, BEARER and DIRECTION set to binary ones;

1> if the UE is a NB-IoT UE:

2> if the UE supports DL channel quality reporting in MSG3 and *cqi-Reporting* is present in *SystemInformationBlockType2-NB*:

3> set the *cqi-NPDCCH* to include the latest results of the downlink channel quality measurements of the carrier where the random access response is received or set the *cqi-NPDCCH* to include the latest results of the downlink channel quality measurements of the anchor carrier in case CB-Msg3 is transmitted on the anchor carrier, as specified in TS 36.133 [16];

NOTE 0: The downlink channel quality measurements use measurement period T1 or T2, as defined in TS 36.133 [16].

2> if the UE is connected to EPC, set *earlyContentionResolution* to TRUE;

1> restore the RRC configuration and security context from the stored UE AS context, except for the following:

- MCG SCell(s) configuration, if stored,

- *nr-SecondaryCellGroupConfig*, if stored;

1> if the UE is initiating UP-EDT for mobile originating calls in accordance with conditions in 5.3.3.1b:

2> if the UE is a NB-IoT UE connected to EPC:

3> if the UE has ANR measurements information available in *VarANR-MeasReport-NB* and if the RPLMN is included in *plmn-IdentityList* stored in *VarANR-MeasReport-NB*:

4> set *anr-InfoAvailable* to TRUE;

1> if the UE is resuming an RRC connection after early security reactivation in accordance with conditions in 5.3.3.18:

2> if the UE is initiating UP-EDT in accordance with conditions in 5.3.3.1b; or

2> if the UE is initiating UP transmission using PUR in accordance with conditions in 5.3.3.1c:

3> restore the PDCP state and re-establish PDCP entities for all SRBs and all DRBs;

3> if *drb-ContinueROHC* has been provided in immediately preceding RRC connection release message, and the UE is requesting to resume RRC connection in the same cell:

4> indicate to lower layers that stored UE AS context is used and that *drb-ContinueROHC* is configured;

4> continue the header compression protocol context for the DRBs configured with the header compression protocol;

3> else:

4> indicate to lower layers that stored UE AS context is used;

4> reset the header compression protocol context for the DRBs configured with the header compression protocol;

3> resume all SRBs and all DRBs;

2> else:

3> if the UE is a NB-IoT UE or the UE is connected to EPC, restore the PDCP state and re-establish the PDCP entity for SRB1;

3> if the UE is connected to 5GC:

4> apply the default configuration for SRB1 as specified in 9.2.1.1;

4> except for NB-IoT, apply the default NR PDCP configuration as specified in TS 38.331 [82], clause 9.2.1 for SRB1;

3> resume SRB1;

2> derive the KeNB key based on the KASME key to which the current KeNB is associated, using the stored value of *nextHopChainingCount* received in the *RRCConnectionRelease* message in the preceding connection, as specified in TS 33.401 [32] for EPC and TS 33.501 [86] for 5GC;

2> derive the KRRCint key associated with the previously configured integrity algorithm, as specified in TS 33.401 [32] for EPC and TS 33.501 [86] for 5GC;

2> derive the KRRCenc key and the KUPenc key associated with the previously configured ciphering algorithm, as specified in TS 33.401 [32] for EPC and TS 33.501 [86] for 5GC;

2> configure lower layers to resume integrity protection using the previously configured algorithm and the KRRCint key derived in this clause to all subsequent messages received and sent by the UE;

2> configure lower layers to resume ciphering and to apply the ciphering algorithm and the KRRCenc key derived in this clause to all subsequent messages received and sent by the UE;

2> configure lower layers to resume ciphering and to apply the ciphering algorithm and the KUPenc key derived in this clause immediately to the user data sent and received by the UE;

2> if the UE is initiating UP-EDT for mobile originated calls in accordance with conditions in 5.3.3.1b:

3> configure the lower layers to use EDT;

2> else if the UE is initiating UP transmission using PUR in accordance with conditions in 5.3.3.1c:

3> configure, except *pur-TimeAlignmentTimer*, the lower layers to use transmission using PUR;

3> deliver the UL grant for transmission using PUR to the MAC entity;

1> else:

2> if SRB1 was configured with NR PDCP:

3> for SRB1, release the NR PDCP entity and establish an E-UTRA PDCP entity with the current (MCG) security configuration;

NOTE 1: The UE applies the LTE ciphering and integrity protection algorithms that are equivalent to the previously configured NR security algorithms.

2> else:

3> for SRB1, restore the PDCP state and re-establish the PDCP entity;

If the UE is resuming the RRC connection from RRC\_INACTIVE, the UE shall set the contents of *RRCConnectionResumeRequest* message as follows:

2> if field *useFullResumeID* is signalled in *SystemInformationBlockType2*:

3> set the *fullI-RNTI* to the stored *fullI-RNTI* value provided in suspend;

2> else:

3> set the *shortI-RNTI* to the stored *shortI-RNTI* value provided in suspend;

2> restore the RRC configuration, RoHC state, the stored QoS flow to DRB mapping rules and the KeNB and KRRCint keys from the UE Inactive AS context except for the following:

- MCG physical layer,

- MCG MAC configuration,

- NR *pdcp-Config*,

- MCG SCell configurations, if stored,

- *nr*-*SecondaryCellGroupConfig*, if stored;

2> set the *shortResumeMAC-I* to the 16 least significant bits of the MAC-I calculated:

3> over the ASN.1 encoded as per clause 8 (i.e., a multiple of 8 bits) *VarShortINACTIVE-MAC-Input*;

3> with the KRRCint key in the UE Inactive AS Context and the previously configured integrity protection algorithm; and

3> with all input bits for COUNT, BEARER and DIRECTION set to binary ones;

2> derive the KeNB key based on the current KeNB or the NH, using the stored *nextHopChainingCount* value, as specified in TS 33.501 [86];

2> derive the KRRCenc key, the KRRCint and the KUPenc key, as specified in TS 33.401 [32];

2> apply the default configuration for SRB1 as specified in 9.2.1.1;

2> apply the default NR PDCP configuration as specified in TS 38.331 [82], clause 9.2.1 for SRB1;

2> configure lower layers to resume integrity protection for all SRBs except SRB0 using the configured algorithm and the KRRCint key derived in this clause immediately, i.e., integrity protection shall be applied to all subsequent messages received and sent by the UE;

2> configure lower layers to resume ciphering for all radio bearers except SRB0 and to apply the configured ciphering algorithm, the KRRCenc key and the KUPenc key derived in this clause, i.e. the ciphering configuration shall be applied to all subsequent messages received and sent by the UE;

Following procedures are applied for both suspended RRC connection and RRC\_INACTIVE:

2> resume SRB1;

NOTE 2: Until successful connection resumption, the default physical layer configuration and the default MAC Main configuration are applied for the transmission of SRB0 and SRB1, and SRB1 is used only for the transfer of *RRCConnectionResume* message, and *RRCConnectionRelease* message if security has been re-activated.

The UE shall submit the *RRCConnectionResumeRequest* message to lower layers for transmission.

The UE shall continue cell re-selection related measurements as well as cell re-selection evaluation.

If the UE is resuming the RRC connection from RRC\_INACTIVE and if lower layers indicate an integrity check failure while T300 is running, the UE shall perform actions specified in 5.3.3.16.

#### 5.3.3.3b Actions related to transmission of *RRCEarlyDataRequest* message

The UE shall set the contents of *RRCEarlyDataRequest* message as follows:

1> if upper layers provide an S-TMSI:

2> set the *s-TMSI* to the value received from upper layers;

1> else if upper layers provide a 5G-S-TMSI:

2> set the *ng-5G-S-TMSI* to the value received from upper layers;

1> set the *establishmentCause* in accordance with the information received from upper layers;

1> if the UE is a NB-IoT UE:

2> if the UE supports DL channel quality reporting and *cqi-Reporting* is present in *SystemInformationBlockType2-NB*:

3> set the *cqi-NPDCCH* to include the latest results of the downlink channel quality measurements of the carrier where the random access response is received or set the *cqi-NPDCCH* to include the latest results of the downlink channel quality measurements of the anchor carrier in case CB-Msg3 is transmitted on the anchor carrier, as specified in TS 36.133 [16];

NOTE: The downlink channel quality measurements may use measurement period T1 or T2, as defined in TS 36.133 [16]. In case period T2 is used the RRC-MAC interactions are left to UE implementation.

1> set the *dedicatedInfoNAS* to include the information received from upper layers;

The UE shall:

1> if the UE is initiating CP-EDT in accordance with conditions in 5.3.3.1b:

2> configure the lower layers to use EDT;

1> else if the UE is initiating CP transmission using PUR in accordance with conditions in 5.3.3.1c:

2> configure, except *pur-TimeAlignmentTimer*, the lower layers to use transmission using PUR;

2> deliver the UL grant for transmission using PUR to the MAC entity;

1> submit the *RRCEarlyDataRequest* message to the lower layers for transmission.

5.3.3.3e UE actions upon receiving CB-Msg3-EDT indications from lower layers

For CP transmission using CB-Msg3-EDT, upon indication from lower layers that CB-Msg3-EDT is successfully completed, the UE shall perform the actions as specified in 5.3.3.4b as if an empty *RRCEarlyDataComplete* message was received.

Upon reception of CB-Msg3-EDT failure indication from lower layers, the procedure ends.

NOTE: When receiving the CB-Msg3-EDT failure indication from lower layers, the RRC procedure is re-initiated. Which procedure (e.g. EDT using random access procedure, random access procedure, CB-Msg3-EDT) is initiated is up to UE implementation.

Next Change

### 6.3.1 System information blocks

#### – *SystemInformationBlockType2*

The IE *SystemInformationBlockType2* contains radio resource configuration information that is common for all UEs.

NOTE: UE timers and constants related to functionality for which parameters are provided in another SIB are included in the corresponding SIB.

*SystemInformationBlockType2* information element

-- ASN1START

SystemInformationBlockType2 ::= SEQUENCE {

ac-BarringInfo SEQUENCE {

ac-BarringForEmergency BOOLEAN,

ac-BarringForMO-Signalling AC-BarringConfig OPTIONAL, -- Need OP

ac-BarringForMO-Data AC-BarringConfig OPTIONAL -- Need OP

} OPTIONAL, -- Need OP

radioResourceConfigCommon RadioResourceConfigCommonSIB,

ue-TimersAndConstants UE-TimersAndConstants,

freqInfo SEQUENCE {

ul-CarrierFreq ARFCN-ValueEUTRA OPTIONAL, -- Need OP

ul-Bandwidth ENUMERATED {n6, n15, n25, n50, n75, n100}

OPTIONAL, -- Need OP

additionalSpectrumEmission AdditionalSpectrumEmission

},

mbsfn-SubframeConfigList MBSFN-SubframeConfigList OPTIONAL, -- Need OR

timeAlignmentTimerCommon TimeAlignmentTimer,

...,

lateNonCriticalExtension OCTET STRING (CONTAINING SystemInformationBlockType2-v8h0-IEs) OPTIONAL,

[[ ssac-BarringForMMTEL-Voice-r9 AC-BarringConfig OPTIONAL, -- Need OP

ssac-BarringForMMTEL-Video-r9 AC-BarringConfig OPTIONAL -- Need OP

]],

[[ ac-BarringForCSFB-r10 AC-BarringConfig OPTIONAL -- Need OP

]],

[[ ac-BarringSkipForMMTELVoice-r12 ENUMERATED {true} OPTIONAL, -- Need OP

ac-BarringSkipForMMTELVideo-r12 ENUMERATED {true} OPTIONAL, -- Need OP

ac-BarringSkipForSMS-r12 ENUMERATED {true} OPTIONAL, -- Need OP

ac-BarringPerPLMN-List-r12 AC-BarringPerPLMN-List-r12 OPTIONAL -- Need OP

]],

[[ voiceServiceCauseIndication-r12 ENUMERATED {true} OPTIONAL -- Need OP

]],

[[ acdc-BarringForCommon-r13 ACDC-BarringForCommon-r13 OPTIONAL, -- Need OP

acdc-BarringPerPLMN-List-r13 ACDC-BarringPerPLMN-List-r13 OPTIONAL -- Need OP

]],

[[

udt-RestrictingForCommon-r13 UDT-Restricting-r13 OPTIONAL, -- Need OR

udt-RestrictingPerPLMN-List-r13 UDT-RestrictingPerPLMN-List-r13 OPTIONAL, -- Need OR

cIoT-EPS-OptimisationInfo-r13 CIOT-EPS-OptimisationInfo-r13 OPTIONAL, -- Need OP

useFullResumeID-r13 ENUMERATED {true} OPTIONAL -- Need OP

]],

[[ unicastFreqHoppingInd-r13 ENUMERATED {true} OPTIONAL -- Need OP

]],

[[ mbsfn-SubframeConfigList-v1430 MBSFN-SubframeConfigList-v1430 OPTIONAL, -- Need OP

videoServiceCauseIndication-r14 ENUMERATED {true} OPTIONAL -- Need OP

]],

[[ plmn-InfoList-r15 PLMN-InfoList-r15 OPTIONAL -- Need OP

]],

[[ cp-EDT-r15 ENUMERATED {true} OPTIONAL, -- Need OR

up-EDT-r15 ENUMERATED {true} OPTIONAL, -- Need OR

idleModeMeasurements-r15 ENUMERATED {true} OPTIONAL, -- Need OR

reducedCP-LatencyEnabled-r15 ENUMERATED {true} OPTIONAL -- Need OR

]],

[[ mbms-ROM-ServiceIndication-r15 ENUMERATED {true} OPTIONAL -- Need OR

]],

[[ rlos-Enabled-r16 ENUMERATED {true} OPTIONAL, -- Need OR

earlySecurityReactivation-r16 ENUMERATED {true} OPTIONAL, -- Need OR

cp-EDT-5GC-r16 ENUMERATED {true} OPTIONAL, -- Need OR

up-EDT-5GC-r16 ENUMERATED {true} OPTIONAL, -- Need OR

cp-PUR-EPC-r16 ENUMERATED {true} OPTIONAL, -- Need OR

up-PUR-EPC-r16 ENUMERATED {true} OPTIONAL, -- Need OR

cp-PUR-5GC-r16 ENUMERATED {true} OPTIONAL, -- Need OR

up-PUR-5GC-r16 ENUMERATED {true} OPTIONAL, -- Need OR

mpdcch-CQI-Reporting-r16 ENUMERATED {fourBits, both} OPTIONAL, -- Need OR

rai-ActivationEnh-r16 ENUMERATED {true} OPTIONAL, -- Need OR

idleModeMeasurementsNR-r16 ENUMERATED {true} OPTIONAL -- Need OR

]],

[[ gnss-PositionFixDurationReporting-r18 ENUMERATED {true} OPTIONAL, -- Need OR

freqBandIndicatorAerial-r18 FreqBandIndicator-r11 OPTIONAL, -- Need OR

freqInfoAerial-r18 AdditionalSpectrumEmission-r18 OPTIONAL, -- Need OR

multiBandInfoListAerial-r18 SEQUENCE (SIZE (1..maxMultiBands)) OF

AdditionalSpectrumEmission-r18 OPTIONAL -- Need OR

]],

[[ cp-CB-Msg3-EDT-r19 ENUMERATED {true} OPTIONAL, -- Need OR

up-CB-Msg3-EDT-r19 ENUMERATED {true} OPTIONAL -- Need OR

]]

}

SystemInformationBlockType2-v8h0-IEs ::= SEQUENCE {

multiBandInfoList SEQUENCE (SIZE (1..maxMultiBands)) OF AdditionalSpectrumEmission OPTIONAL, -- Need OR

nonCriticalExtension SystemInformationBlockType2-v9e0-IEs OPTIONAL

}

SystemInformationBlockType2-v9e0-IEs ::= SEQUENCE {

ul-CarrierFreq-v9e0 ARFCN-ValueEUTRA-v9e0 OPTIONAL, -- Cond ul-FreqMax

nonCriticalExtension SystemInformationBlockType2-v9i0-IEs OPTIONAL

}

SystemInformationBlockType2-v9i0-IEs ::= SEQUENCE {

-- Following field is for any non-critical extensions from REL-9

nonCriticalExtension OCTET STRING (CONTAINING SystemInformationBlockType2-v10m0-IEs) OPTIONAL,

dummy SEQUENCE {} OPTIONAL

}

SystemInformationBlockType2-v10m0-IEs ::= SEQUENCE {

freqInfo-v10l0 SEQUENCE {

additionalSpectrumEmission-v10l0 AdditionalSpectrumEmission-v10l0

} OPTIONAL,

multiBandInfoList-v10l0 SEQUENCE (SIZE (1..maxMultiBands)) OF

AdditionalSpectrumEmission-v10l0 OPTIONAL,

nonCriticalExtension SystemInformationBlockType2-v10n0-IEs OPTIONAL

}

SystemInformationBlockType2-v10n0-IEs ::= SEQUENCE {

-- Following field is for non-critical extensions up-to REL-12

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SystemInformationBlockType2-v13c0-IEs OPTIONAL

}

SystemInformationBlockType2-v13c0-IEs ::= SEQUENCE {

uplinkPowerControlCommon-v13c0 UplinkPowerControlCommon-v1310 OPTIONAL, -- Need OR

-- Following field is for non-critical extensions from REL-13

nonCriticalExtension SEQUENCE {} OPTIONAL

}

AC-BarringConfig ::= SEQUENCE {

ac-BarringFactor ENUMERATED {

p00, p05, p10, p15, p20, p25, p30, p40,

p50, p60, p70, p75, p80, p85, p90, p95},

ac-BarringTime ENUMERATED {s4, s8, s16, s32, s64, s128, s256, s512},

ac-BarringForSpecialAC BIT STRING (SIZE(5))

}

MBSFN-SubframeConfigList ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF MBSFN-SubframeConfig

MBSFN-SubframeConfigList-v1430 ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF MBSFN-SubframeConfig-v1430

AC-BarringPerPLMN-List-r12 ::= SEQUENCE (SIZE (1.. maxPLMN-r11)) OF AC-BarringPerPLMN-r12

AC-BarringPerPLMN-r12 ::= SEQUENCE {

plmn-IdentityIndex-r12 INTEGER (1..maxPLMN-r11),

ac-BarringInfo-r12 SEQUENCE {

ac-BarringForEmergency-r12 BOOLEAN,

ac-BarringForMO-Signalling-r12 AC-BarringConfig OPTIONAL, -- Need OP

ac-BarringForMO-Data-r12 AC-BarringConfig OPTIONAL -- Need OP

} OPTIONAL, -- Need OP

ac-BarringSkipForMMTELVoice-r12 ENUMERATED {true} OPTIONAL, -- Need OP

ac-BarringSkipForMMTELVideo-r12 ENUMERATED {true} OPTIONAL, -- Need OP

ac-BarringSkipForSMS-r12 ENUMERATED {true} OPTIONAL, -- Need OP

ac-BarringForCSFB-r12 AC-BarringConfig OPTIONAL, -- Need OP

ssac-BarringForMMTEL-Voice-r12 AC-BarringConfig OPTIONAL, -- Need OP

ssac-BarringForMMTEL-Video-r12 AC-BarringConfig OPTIONAL -- Need OP

}

ACDC-BarringForCommon-r13 ::= SEQUENCE {

acdc-HPLMNonly-r13 BOOLEAN,

barringPerACDC-CategoryList-r13 BarringPerACDC-CategoryList-r13

}

ACDC-BarringPerPLMN-List-r13 ::= SEQUENCE (SIZE (1.. maxPLMN-r11)) OF ACDC-BarringPerPLMN-r13

ACDC-BarringPerPLMN-r13 ::= SEQUENCE {

plmn-IdentityIndex-r13 INTEGER (1..maxPLMN-r11),

acdc-OnlyForHPLMN-r13 BOOLEAN,

barringPerACDC-CategoryList-r13 BarringPerACDC-CategoryList-r13

}

BarringPerACDC-CategoryList-r13 ::= SEQUENCE (SIZE (1..maxACDC-Cat-r13)) OF BarringPerACDC-Category-r13

BarringPerACDC-Category-r13 ::= SEQUENCE {

acdc-Category-r13 INTEGER (1..maxACDC-Cat-r13),

acdc-BarringConfig-r13 SEQUENCE {

ac-BarringFactor-r13 ENUMERATED {

p00, p05, p10, p15, p20, p25, p30, p40,

p50, p60, p70, p75, p80, p85, p90, p95},

ac-BarringTime-r13 ENUMERATED {s4, s8, s16, s32, s64, s128, s256, s512}

} OPTIONAL -- Need OP

}

UDT-Restricting-r13 ::= SEQUENCE {

udt-Restricting-r13 ENUMERATED {true} OPTIONAL, --Need OR

udt-RestrictingTime-r13 ENUMERATED {s4, s8, s16, s32, s64, s128, s256, s512} OPTIONAL --Need OR

}

UDT-RestrictingPerPLMN-List-r13 ::= SEQUENCE (SIZE (1..maxPLMN-r11)) OF UDT-RestrictingPerPLMN-r13

UDT-RestrictingPerPLMN-r13 ::= SEQUENCE {

plmn-IdentityIndex-r13 INTEGER (1..maxPLMN-r11),

udt-Restricting-r13 UDT-Restricting-r13 OPTIONAL --Need OR

}

CIOT-EPS-OptimisationInfo-r13 ::= SEQUENCE (SIZE (1.. maxPLMN-r11)) OF CIOT-OptimisationPLMN-r13

CIOT-OptimisationPLMN-r13::= SEQUENCE {

up-CIoT-EPS-Optimisation-r13 ENUMERATED {true} OPTIONAL, -- Need OP

cp-CIoT-EPS-Optimisation-r13 ENUMERATED {true} OPTIONAL, -- Need OP

attachWithoutPDN-Connectivity-r13 ENUMERATED {true} OPTIONAL -- Need OP

}

PLMN-InfoList-r15 ::= SEQUENCE (SIZE (1..maxPLMN-r11)) OF PLMN-Info-r15

PLMN-Info-r15 ::= SEQUENCE {

upperLayerIndication-r15 ENUMERATED {true} OPTIONAL -- Need OR

}

-- ASN1STOP

| *SystemInformationBlockType2* field descriptions |
| --- |
| ***ac-BarringFactor***  If the random number drawn by the UE is lower than this value, access is allowed. Otherwise the access is barred. The values are interpreted in the range [0,1): p00 = 0, p05 = 0.05, p10 = 0.10,…, p95 = 0.95. Values other than p00 can only be set if all bits of the corresponding *ac-BarringForSpecialAC* are set to 0. |
| ***ac-BarringForCSFB***  Access class barring for mobile originating CS fallback. |
| ***ac-BarringForEmergency***  Access class barring for AC 10. |
| ***ac-BarringForMO-Data***  Access class barring for mobile originating calls. |
| ***ac-BarringForMO-Signalling***  Access class barring formobile originating signalling. |
| ***ac-BarringForSpecialAC***  Access class barring for AC 11-15. The first/ leftmost bit is for AC 11, the second bit is for AC 12, and so on. |
| ***ac-BarringTime***  Mean access barring time value in seconds. |
| ***acdc-BarringConfig***  Barring configuration for an ACDC category. If the field is absent, access to the cell is considered as not barred for the ACDC category in accordance with clause 5.3.3.13. |
| ***acdc-Category***  Indicates the ACDC category as defined in TS 24.105 [72]. |
| ***acdc-OnlyForHPLMN***  Indicates whether ACDC is applicable for UEs not in their HPLMN for the corresponding PLMN. *TRUE* indicates that ACDC is applicable only for UEs in their HPLMN for the corresponding PLMN. *FALSE* indicates that ACDC is applicable for both UEs in their HPLMN and UEs not in their HPLMN for the corresponding PLMN. |
| ***additionalSpectrumEmission***  The UE requirements related to IE *AdditionalSpectrumEmission* are defined in TS 36.101 [42], table 6.2.4-1, for UEs neither in CE nor BL UEs and TS 36.101 [42], table 6.2.4E-1, for UEs in CE or BL UEs. NOTE 1. |
| ***attachWithoutPDN-Connectivity***  If present, the field indicates that attach without PDN connectivity as specified in TS 24.301 [35] is supported for this PLMN. |
| ***barringPerACDC-CategoryList***  A list of barring information per ACDC category according to the order defined in TS 22.011 [10]. The first entry in the list corresponds to the highest ACDC category of which applications are the least restricted in access attempts at a cell, the second entry in the list corresponds to the ACDC category of which applications are restricted more than applications of the highest ACDC category in access attempts at a cell, and so on. The last entry in the list corresponds to the lowest ACDC category of which applications are the most restricted in access attempts at a cell. |
| ***cIoT-EPS-OptimisationInfo***  A list of CIoT EPS related parameters. Value 1 indicates parameters for the PLMN listed 1st in the 1st *plmn-IdentityList* included in SIB1. Value 2 indicates parameters for the PLMN listed 2nd in the same *plmn-IdentityList,* or when no more PLMN are present within the same *plmn-IdentityList,* then the value indicates paramters for PLMN listed 1st in the subsequent *plmn-IdentityList* within the same SIB1 and so on.NOTE 1. |
| ***cp-CB-Msg3-EDT***  This field indicates whether the UE is allowed to initiate CP-EDT using the CB-Msg3-EDT procedure in NTN, see 5.3.3.1b. |
| ***cp-CIoT-EPS-Optimisation***  This field indicates if the UE is allowed to establish the connection with Control plane CIoT EPS Optimisation, see TS 24.301 [35]. |
| ***cp-EDT***  This field indicates whether the UE is allowed to initiate CP-EDT when connected to EPC, see 5.3.3.1b. |
| ***cp-EDT-5GC***  This field indicates whether the UE is allowed to initiate CP-EDT when connected to 5GC, see 5.3.3.1b. |
| ***cp-PUR-5GC***  This field indicates whether CP transmission using PUR is supported in the cell when connected to 5GC, see 5.3.3.1c. |
| ***cp-PUR-EPC***  This field indicates whether CP transmission using PUR is supported in the cell when connected to EPC, see 5.3.3.1c. |
| ***dummy***  This field is not used in the specification. If received it shall be ignored by the UE. |
| ***earlySecurityReactivation***  If present, this field indicates that early security reactivation when resuming a suspended RRC connection as specified in 5.3.3.18 is supported. |
| ***gnss-PositionFixDurationReporting***  If present, this field indicates that UEs capable of performing GNSS position fix in RRC\_CONNECTED are configured to include the time duration required to acquire a GNSS position in *RRCConnectionSetupComplete*, *RRCConnectionResumeComplete*, and *RRCConnectionReestablishmentComplete*. |
| ***idleModeMeasurements***  This field indicates that a UE that is configured for EUTRA idle/inactive measurements shall perform the measurements while camping in this cell and report availability of these measurements when establishing or resuming a connection in this cell. If absent, a UE is not required to perform EUTRA idle/inactive measurements. |
| ***idleModeMeasurementsNR***  This field indicates that a UE that is configured for NR idle/inactive measurements shall perform the measurements while camping in this cell and report availability of these measurements when establishing or resuming a connection in this cell. If absent, a UE is not required to perform NR idle/inactive measurements. |
| ***mbms-ROM-ServiceIndication***  This field indicates whether the UE is allowed to send*MBMSInterestIndication* message for the purpose of indicating receive only mode MBMS service parameters. | |
| ***mbsfn-SubframeConfigList***  Defines the subframes that are reserved for MBSFN in downlink.  NOTE 1. If the cell is a FeMBMS/Unicast mixed cell, EUTRAN includes *mbsfn-SubframeConfigList-v1430*. If a FeMBMS/Unicast mixed cell does not use sub-frames #4 or #9 as MBSFN sub-frames, *mbsfn-SubframeConfigList-v1430* is still included and indicates all sub-frames as non-MBSFN sub-frames. |
| ***mpdcch-CQI-Reporting***  This field indicates if downlink channel quality reporting during random access procedureis allowed, see TS 36.321 [6]. Value 'fourBits' indicates 4-bit CQI reporting is allowed and value 'both' indicates both 2-bit and 4-bit reporting are allowed. |
| ***multiBandInfoList***  A list of *AdditionalSpectrumEmission* i.e. one for each additional frequency band included in *multiBandInfoList* in *SystemInformationBlockType1,* listed in the same order. If E-UTRAN includes *multiBandInfoList-v10l0* it includes the same number of entries, and listed in the same order, as in *multiBandInfoList*. |
| ***plmn-IdentityIndex***  Index of the PLMN across the *plmn-IdentityList* fields included in SIB1. Value 1 indicates the PLMN listed 1st in the 1st *plmn-IdentityList* included in SIB1. Value 2 indicates the PLMN listed 2nd in the same *plmn-IdentityList*, or when no more PLMN are present within the same *plmn-IdentityList*, then the PLMN listed 1st in the subsequent *plmn-IdentityList* within the same SIB1 and so on.NOTE 1. |
| ***plmn-InfoList***  If E-UTRAN includes this field, it includes the same number of entries, and listed in the same order as PLMNs across the plmn-IdentityList fields included in SIB1. I.e. the first entry corresponds to the first entry of the combined list that results from concatenating the entries included in the second to the original plmn-IdentityList field. |
| ***rai-ActivationEnh***  Indicates whether UE connected to EPC is allowed to report the AS release assistance indication using the DCQR and AS RAI MAC CE in the cell as specified in TS 36.321 [6]. | |
| ***reducedCP-LatencyEnabled***  If present, reduced control plane latency is enabled. UEs supporting reduced CP latency transmit Msg3 according to timing as specified in TS 36.213 [23] when transmitting *RRCConnectionResumeRequest* in Msg3. | |
| ***rlos-Enabled***  Indicates whether access to RLOS is allowed as specified in TS 23.401 [41]. | |
| ***ssac-BarringForMMTEL-Video***  Service specific access class barring for MMTEL video originating calls. |
| ***ssac-BarringForMMTEL-Voice***  Service specific access class barring for MMTEL voice originating calls. |
| ***udt-Restricting***  Value TRUE indicates that the UE should indicate to the higher layers to restrict unattended data traffic TS 22.101 [77] irrespective of the UE being in RRC\_IDLE or RRC\_CONNECTED. The UE shall not indicate to the higher layers if the UE has one or more Access Classes, as stored on the USIM, with a value in the range 11..15, which is valid for the UE to use according to TS 22.011 [10] and TS 23.122 [11]. |
| ***udt-RestrictingTime***  If present and when the *udt-Restricting* changes from TRUE, the UE runs a timer for a period equal to rand \* *udt-RestrictingTime*, where rand is a random number drawn that is uniformly distributed in the range 0 ≤ rand < 1 value in seconds. The timer stops if *udt-Restricting* changes to TRUE. Upon timer expiry, the UE indicates to the higher layers that the restriction is alleviated. |
| ***unicastFreqHoppingInd***  This field indicates if the UE is allowed to indicate support of frequency hopping for unicast MPDCCH/PDSCH/PUSCH as described in TS 36.321 [6]. This field is included only in the BR version of SI message carrying *SystemInformationBlockType2.* |
| ***ul-Bandwidth***  Parameter: transmission bandwidth configuration, NRB, in uplink, see TS 36.101 [42], table 5.6-1 and TS 36.108 [114], table 5.3A-1. Value n6 corresponds to 6 resource blocks, n15 to 15 resource blocks and so on. If for FDD this parameter is absent, the uplink bandwidth is equal to the downlink bandwidth. For TDD this parameter is absent and it is equal to the downlink bandwidth. NOTE 1. |
| ***ul-CarrierFreq***  For FDD: If absent, the (default) value determined from the default TX-RX frequency separation defined in TS 36.101 [42], table 5.7.3-1 and 36.108 [114], table 5.4A.2-1, applies.  For TDD: This parameter is absent and it is equal to the downlink frequency. NOTE 1. |
| ***up-CB-Msg3-EDT***  This field indicates whether the UE is allowed to initiate UP-EDT using the CB-Msg3-EDT procedure in NTN, see 5.3.3.1b. |
| ***up-CIoT-EPS-Optimisation***  This field indicates if the UE is allowed to resume the connection with User plane CIoT EPS Optimisation, see TS 24.301 [35]. |
| ***up-EDT***  This field indicates whether the UE is allowed to initiate UP-EDT when connected to EPC, see 5.3.3.1b. |
| ***up-EDT-5GC***  This field indicates whether the UE is allowed to initiate UP-EDT when connected to 5GC, see 5.3.3.1b. |
| ***up-PUR-5GC***  This field indicates whether UP transmission using PUR is supported in the cell when connected to 5GC, see 5.3.3.1c. |
| ***up-PUR-EPC***  This field indicates whether UP transmission using PUR is supported in the cell when connected to EPC, see 5.3.3.1c. |
| ***upperLayerIndication***  Indication to be provided to upper layers. |
| ***useFullResumeID***  This field indicates if the UE indicates full resume ID of 40 bits in *RRCConnectionResumeRequest*. |
| ***videoServiceCauseIndication***  Indicates whether the UE is requested to use the establishment cause *mo-VoiceCall* for mobile originating MMTEL video calls. |
| ***voiceServiceCauseIndication***  Indicates whether UE is requested to use the establishment cause *mo-VoiceCall* for mobile originating MMTEL voice calls. |

| Conditional presence | Explanation |
| --- | --- |
| *ul-FreqMax* | The field is mandatory present if *ul-CarrierFreq* (i.e. without suffix) is present and set to *maxEARFCN*. Otherwise the field is not present. |

NOTE 1: E-UTRAN sets this field to the same value for all instances of SI message that are broadcasted within the same cell.

Next Change

#### – *SystemInformationBlockType33*

The IE *SystemInformationBlockType33* contains satellite assistance information for neighbour cells. When the *SystemInformationBlockType33* is signalled in a TN cell, it may contain satellite assistance information for BL UEs, UEs in enhanced coverage, and/or NB-IoT NTN capable UEs.

*SystemInformationBlockType33* information element

-- ASN1START

SystemInformationBlockType33-r18 ::= SEQUENCE {

neighSatelliteInfoList-r18 NeighSatelliteInfoList-r18 OPTIONAL, -- Need OR

neighValidityDuration-r18 ENUMERATED {s5, s10, s15, s20, s25, s30, s35, s40,

s45, s50, s55, s60, s120, s180, s240, s900}

OPTIONAL, -- Need OP

lateNonCriticalExtension OCTET STRING OPTIONAL,

...,

[[

neighSatelliteInfoListNR-r19 NeighSatelliteInfoListNR-r19 OPTIONAL, -- Need OR

neighSatelliteInfoList-v1900 NeighSatelliteInfoList-v1900 OPTIONAL, -- Need OR

neighSatelliteInfoListNB-r19 NeighSatelliteInfoListNB-r19 OPTIONAL -- Need OR

]]

}

NeighSatelliteInfoListNR-r19 ::= SEQUENCE (SIZE(1..maxSat-r17)) OF NeighSatelliteInfoNR-r19

NeighSatelliteInfoList-v1900 ::= SEQUENCE (SIZE(1..maxSat-r17)) OF NeighSatelliteInfo-v1900

NeighSatelliteInfoListNB-r19 ::= SEQUENCE (SIZE(1..maxSat-r17)) OF NeighSatelliteInfo-r18

NeighSatelliteInfoList-r18 ::= SEQUENCE (SIZE(1..maxSat-r17)) OF NeighSatelliteInfo-r18

NeighSatelliteInfo-r18 ::= SEQUENCE {

satelliteId-r18 SatelliteId-r18,

ephemerisInfo-r18 CHOICE {

stateVectors-r18 EphemerisStateVectors-r17,

orbitalParameters-r18 EphemerisOrbitalParameters-r17

},

nta-CommonParameters-r18 SEQUENCE {

nta-Common-r18 INTEGER (0..8316827) OPTIONAL, -- Need OP

nta-CommonDrift-r18 INTEGER (-261935..261935) OPTIONAL, -- Need OP

nta-CommonDriftVariation-r18 INTEGER (0..29479) OPTIONAL -- Need OP

},

epochTime-r18 SEQUENCE {

startSFN-r18 INTEGER (0..1023),

startSubFrame-r18 INTEGER (0..9)

} OPTIONAL, -- Need OP

k-Mac-r18 INTEGER (1..512) OPTIONAL, -- Need OP

t-ServiceStartNeigh-r18 TimeOffsetUTC-r17 OPTIONAL -- Need OR

}

NeighSatelliteInfoNR-r19::= SEQUENCE {

satelliteId-r19 SatelliteId-r18,

ephemerisInfo-r19 CHOICE {

stateVectors-r19 EphemerisStateVectors-r17,

orbitalParameters-r19 EphemerisOrbitalParameters-r17

} OPTIONAL, -- Need OP

nta-CommonParametersNR-r19 SEQUENCE {

nta-CommonNR-r19 INTEGER (0.. 66485757) OPTIONAL, -- Need OP

nta-CommonDriftNR-r19 INTEGER (-257303..257303) OPTIONAL, -- Need OP

nta-CommonDriftVariationNR-r19 INTEGER (0..28949) OPTIONAL -- Need OP

},

epochTime-r19 SEQUENCE {

startSFN-r19 INTEGER (0..1023),

startSubFrame-r19 INTEGER (0..9)

} OPTIONAL, -- Need OP

k-Mac-r19 INTEGER (1..512) OPTIONAL, -- Need OP

ntn-PolarizationDL-r19 ENUMERATED {rhcp,lhcp,linear} OPTIONAL -- Need OR

}

NeighSatelliteInfo-v1900 ::= SEQUENCE {

sf-OperationModeNeigh-r19 ENUMERATED {sf} OPTIONAL, -- Need OP

t-ModeSwitchingNeigh-r19 TimeOffsetUTC-r17 OPTIONAL -- Need OR

}

-- ASN1STOP

|  |
| --- |
| *SystemInformationBlockType33* field descriptions |
| ***ephemerisInfo***  Ephemeris data for a neighbour satellite.  This field is mandatory present in *NeighSatelliteInfoNR*, if the *satelliteId* in the same entry of *neighSatelliteInfoListNR* does not match any *satelliteId* values included in *neighSatelliteInfoList*. If this field is absent in *NeighSatelliteInfoNR* and the *satelliteId* in the same entry of *neighSatelliteInfoListNR* equals a *satelliteId* value included in *neighSatelliteInfoList*, UE uses the *ephemerisInfo* identified by that *satelliteId* in the *neighSatelliteInfoList.* |
| ***epochTime***  Epoch time of the neighbour satellite ephemeris data and common TA parameters, see TS 36.213 [23]. The reference point for epoch time of the neighbour satellite ephemeris and Common TA parameters is the uplink time synchronization reference point of the serving cell when this field is provided in an NTN cell and the eNB when this field is provided in a TN cell.  *epochTime* is the starting time of a DL subframe indicated by *startSFN* and *startSubframe*. If this field is absent in an NTN cell, the UE uses epoch time of the serving cell, otherwise the field is based on the timing of the serving cell, i.e. the SFN and sub-frame number indicated in this field refers to the SFN and sub-frame of the serving cell. *The startSFN* indicates the SFN nearest to the frame where the message indicating the *epochTime* is received. If this field is absent in a TN cell, the epoch time is the starting time of the DL subframe corresponding to the end of the SI window during which the SI message carrying SIB33(-NB) is transmitted. |
| ***k-Mac***  Scheduling offset used when downlink and uplink frame timing are not aligned at the eNB, see TS 36.213 [23]. Unit in ms.  If the field if absent, the UE uses the (default) value of 0. |
| ***neighSatelliteInfoList***  Neighbour satellite information. If E-UTRAN includes *neighSatelliteInfoList-v1900*, it includes the same number of entries and listed in the same order as in *neighSatelliteInfoList-r18*. |
| ***neighSatelliteInfoListNR***  Indicates a list of satellites providing NR NTN neighbor cells. This field is only included in a TN cell. |
| ***neighValidityDuration***  Validity duration of the neighbour satellite ephemeris data and common TA parameters, i.e. maximum time duration (from *epochTime*) during which the UE can apply the satellite ephemeris without acquiring new satellite ephemeris, see TS 36.213 [23]. Unit in second.  Value *s5* corresponds to 5 seconds, value *s10* corresponds to 10 seconds and so on.  If this field is absent in an NTN cell, the UE uses validity duration from the serving cell assistance information. If this field is absent in a TN cell, how the UE sets validity duration is left to UE implementation. |
| ***nta-Common, nta-CommonNR***  Network-controlled common TA, see TS 36.213 [23]. Unit of μs.  For *nta-Common*, step of 32.55208 ×10-3 μs. For *nta-CommonNR*, step of 4.072 × 10-3μs. Actual value = field value \* step.  If the field is absent, the UE uses the (default) value of 0. |
| ***nta-CommonDrift, nta-CommonDriftNR***  Drift rate of the common TA, see TS 36.213 [23]. Unit of μs/s.  Step of 0.2 ×10-3 μs/s. Actual value = field value \* 0.2 ×10-3.  If the field is absent, the UE uses the (default) value of 0. |
| ***nta-CommonDriftVariation, nta-CommonDriftVariationNR***  Drift rate variation of the common TA, see TS 36.213 [23]. Unit of μs/s2.  Step of 0.2 ×10-4 μs/s2. Actual value = field value \* 0.2 ×10-4.  If the field is absent, the UE uses the (default) value of 0. |
| ***ntn-PolarizationDL***  If present, this parameter indicates polarization information for downlink transmission on service link of a satellite for NR NTN: including Right hand, Left hand circular polarizations (RHCP, LHCP) and Linear polarization. |
| ***sf-OperationModeNeigh***  Indicates that the neighbour cell associated with the satellite is operating in the Store and Forward Satellite operation mode. If this field is present, it means the neighbour cell is operating in the Store and Forward Satellite operation mode. Otherwise, UE assumes the neighbour cell is operating in the normal mode. |
| ***t-ModeSwitchingNeigh***  If *sf-OperationModeNeigh* is present for a neighbour cell associated with the satellite, this field indicates the time information on when this neighbour cell is going to switch from the Store and Forward Satellite operation mode to the normal mode; otherwise, this field indicates the time information on when this neighbour cell is going to switch from the normal mode to the Store and Forward Satellite operation mode. |
| ***t-ServiceStartNeigh***  Indicates the earliest time when the area covered by the current serving cell is going to be covered by the neighbour cell(s) served by the satellite indicated by *satelliteId*, see 5.5.3.1, 5.5.8 and 36.304 [4]. This field is only present for the NTN quasi-Earth fixed neighbour cell(s). |

Next Change

### 6.3.2 Radio resource control information elements

#### – CB-Msg3-ConfigSIB

The IE *CB-Msg3-ConfigSIB* is used to specify the CB-Msg3-EDT configuration.

*CB-Msg3-ConfigSIB* information element

-- ASN1START

CB-Msg3-ConfigSIB-r19 ::= SEQUENCE {

cb-Msg3-MinRSRP-Threshold-r19 RSRP-Range OPTIONAL, --Need OR

cb-Msg3-RSRP-CE-Level-r19 RSRP-Range OPTIONAL, --Need OR

cb-Msg3-ConfigList-r19 CB-Msg3-ConfigList-r19,

powerRampingParameters-r19 PowerRampingParameters-r19

}

CB-Msg3-ConfigList-r19 ::= SEQUENCE (SIZE (1.. maxCE-Level-CB-Msg3-r19)) OF CB-Msg3-Config-r19

CB-Msg3-Config-r19 ::= SEQUENCE {

cb-Msg3-TBS-r19 ENUMERATED {b144, b328, b408, b504, b600, b712,

b808, b936},

cb-Msg3-NumOfReplicas-r19 INTEGER(1..4),

cb-Msg3-TimeResource-r19 SEQUENCE {

pusch-Periodicity-r19 ENUMERATED {sf2, sf4, sf8, sf16, sf32, sf64, sf128,

sf256},

pusch-StartSFN-r19 INTEGER (0..1023),

pusch-StartSubframe-r19 INTEGER (0..9)

},

cb-Msg3-MPDCCH-Config-r19 CB-Msg3-MPDCCH-Config-r19,

cb-Msg3-PUCCH-Config-r19 CB-Msg3-PUCCH-Config-r19,

cb-Msg3-PUSCH-Config-r19 CB-Msg3-PUSCH-Config-r19,

cb-Msg3-TxWindow-r19 SEQUENCE {

windowSize-r19 ENUMERATED {p4, p8, p12, p16, p20,

p24, p28, p30},

windowPeriodicity-r19 ENUMERATED {n1, n2, n4, n8, n16, n32, n64,

n128}

} OPTIONAL, --Need OP

cb-Msg3-ResponseWindow-r19 ENUMERATED {sf240, sf480, sf960,

sf1920, sf3840, sf5760, sf7680, sf10240},

cb-Msg3-MaxAttemptNum-r19 ENUMERATED {n2, n3, n4, n5, n6, n7, n8, n10}

OPTIONAL, --Need OP

...

}

CB-MSG3-MPDCCH-Config-r19 ::= SEQUENCE {

mpdcch-Narrowband-r19 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13),

mpdcch-PRB-PairsConfig-r19 SEQUENCE{

numberPRB-Pairs-r19 ENUMERATED {n2, n4, n6, spare1},

resourceBlockAssignment-r19 BIT STRING (SIZE(4))

},

mpdcch-NumRepetition-r19 ENUMERATED {r1, r2, r4, r8, r16, r32, r64, r128, r256},

mpdcch-StartSF-CSS-r19 ENUMERATED {v1, v1dot5, v2, v2dot5, v4, v5, v8, v10},

mpdcch-Offset-CSS-r19 ENUMERATED {zero, oneEighth, oneQuarter,

threeEighth, oneHalf, fiveEighth,

threeQuarter, sevenEighth}

}

CB-Msg3-PUCCH-Config-r19 ::= SEQUENCE {

n1PUCCH-AN-r19 INTEGER (0..2047) OPTIONAL, -- Need OR

pucch-NumRepetitionCE-Format1-r19 ENUMERATED {n1, n2, n4, n8} OPTIONAL -- Need OR

}

CB-Msg3-PUSCH-Config-r19 ::= SEQUENCE {

numRUs-r19 BIT STRING (SIZE(2)),

prb-AllocationInfoSet-r19 SEQUENCE (SIZE(1..48)) OF BIT STRING (SIZE(10)),

mcs-r19 BIT STRING (SIZE(4)),

numRepetitions-r19 BIT STRING (SIZE(3)),

p0-UE-PUSCH-r19 INTEGER (-8..7),

alpha-r19 Alpha-r12

}

PowerRampingParameters-r19 ::= SEQUENCE {

powerRampingStep-r19 ENUMERATED {dB0, dB2, dB4, dB6},

cb-Msg3-InitialReceivedTargetPower-r19 ENUMERATED {

dBm-120, dBm-118, dBm-116, dBm-114, dBm-112,

dBm-110, dBm-108, dBm-106, dBm-104, dBm-102,

dBm-100, dBm-98, dBm-96, dBm-94,

dBm-92, dBm-90}

}

-- ASN1STOP

|  |
| --- |
| *CB-Msg3-ConfigSIB* field descriptions |
| ***alpha***  Parameter: *αc*(3). See TS 36.213 [23], clause 5.1.1.1. |
| ***cb-Msg3-ConfigList***  CB-Msg3-EDT configuration for each CE level applicable to a UE performing CB-Msg3-EDT. The first entry in the list is the CB-Msg3-EDT configuration for CE level 0, and the second entry in the list is the CB-Msg3-EDT configuration for CE level 1. |
| ***cb-Msg3-InitialReceivedTargetPower***  Initial power for CB-Msg3 transmission as specified in TS 36.321 [6]. Value in dBm. Value dBm-120 corresponds to -120 dBm, dBm-118 corresponds to -118 dBm and so on. |
| ***cb-Msg3-MaxAttemptNum***  The maximum number of attempts of CB-Msg3-EDT within this CE level. If the field is absent, the UE shall assume no re-attempt. |
| ***cb-Msg3-MinRSRP-Threshold***  Indicates the minimum RSRP threshold for initiating CB-Msg3-EDT. |
| ***cb-Msg3-NumOfReplicas***  Indicates the number of replicas that UE should send for CB-Msg3-EDT. |
| ***cb-Msg3-PUSCH-Config***  Indicates PUSCH resource for CB-Msg3-EDT. *numRUs* indicates DCI field for PUSCH number of resource units, see TS 36.213 [23] clause 8.1.6. *prb-AllocationInfoSet* contains a list of information for PRB allocation which indicates DCI field for PUSCH resource block assignment, see TS 36.212 [22], clause 5.3.3.1.10. *mcs* indicates DCI field for PUSCH modulation and coding scheme, see TS 36.213 [23] clause 8.6. *numRepetitions* indicates DCI field for PUSCH repetition number, see TS 36.213 [23] clause 8.0.  *numRUs* set to '00' indicates use of full-PRB resource allocation, otherwise sub-PRB resource allocation as defined in TS 36.213 [23], clause 8.1.6. |
| ***cb-Msg3-ResponseWindow***  MPDCCH search space window duration. See TS 36.321 [6] and TS 36.213 [23]. Value in subframes. Value *sf240* corresponds to 240 subframes, value *sf480* corresponds to 480 subframes and so on. |
| ***cb-Msg3-RSRP-CE-Level***  RSRP threshold for UEs to select the configuration for CB-Msg3-EDT. |
| ***cb-Msg3-TBS***  Indicates the TB size threshold for initiating CB-Msg3-EDT within this CE level. Value b114 corresponds to 114 bits, b328 corresponds to 328 bits and so on. |
| ***cb-Msg3-TxWindow***  CB-Msg3 transmission window configuration. The start time of the CB-Msg3 transmission window is aligned with the PUSCH start time indicated by *pusch-StartSFN-r19* and *pusch-StartSubframe-r19*. When *cb-Msg3-NumOfReplicas-r19* equals 1, this field is absent. For *windowSize*,value *p4* corresponds to 4 PUSCH periods, *p8* corresponds to 8 PUSCH periods and so on. For *windowPeriodicity*,value *n1* corresponds to 10ms, *n2* corresponds to 20ms and so on. |
| ***mpdcch-Narrowband***  Indicates a set of narrowbands on which the UE monitors for MPDCCH, see TS 36.213 [23], clause 9.1.5. Field values (1..*maxAvailNarrowBands-r13*) correspond to narrowband indices (0..*maxAvailNarrowBands-r13*-1) as specified in TS 36.211 [21]. |
| ***mpdcch-NumRepetition***  Maximum number of repetitions levels for CSS for MPDCCH, see TS 36.213 [23]. |
| ***mpdcch-Offset-CSS***  Fractional period offset of starting subframe for an MPDCCH common search space, see TS 36.213 [23]. |
| ***mpdcch-PRB-PairsConfig***  Indicates the configuration of physical resource-block pairs used for MPDCCH. See TS 36.213 [23]. *mpdcch-PRB-Pairs* indicates the number of PRB pairs. Value n2 corresponds to 2 PRB pairs; n4 corresponds to 4 PRB pairs and so on. *resourceBlockAssignment*indicates the index to a specific combination of PRB pair for MPDCCH set. See TS 36.213 [23], clause 9.1.4.4. |
| ***mpdcch-StartSF-CSS***  Starting subframe configuration for an MPDCCH common search space, see TS 36.213 [23]. Value v1 corresponds to 1, value v1dot5 corresponds to 1.5, and so on. |
| ***n1PUCCH-AN***  Indicates PUCCH ACK resource offset, see TS 36.213 [23], clause 10.1. |
| ***p0-UE-PUSCH***  Parameter: P0\_UE\_PUSCH,c (3). See TS 36.213 [23], clause 5.1.1.1, unit dB. |
| ***powerRampingStep***  Power ramping factor in TS 36.321 [6]. Value in dB. Value dB0 corresponds to 0 dB, dB2 corresponds to 2 dB and so on. |
| ***pucch-NumRepetitionCE-Format1***  Number of PUCCH repetitions for PUCCH format 1/1a, see TS 36.211 [21] and TS 36.213 [23]. Value n1 corresponds to 1 repetition, value n2 corresponds to 2 repetitions, and so on. |

Next Change

### 6.7.3 NB-IoT information elements

#### 6.7.3.1 NB-IoT System information blocks

#### – *SystemInformationBlockType2-NB*

The IE *SystemInformationBlockType2-NB* contains radio resource configuration information that is common for all UEs.

NOTE: UE timers and constants related to functionality for which parameters are provided in another SIB are included in the corresponding SIB.

*SystemInformationBlockType2-NB* information element

-- ASN1START

SystemInformationBlockType2-NB-r13 ::= SEQUENCE {

radioResourceConfigCommon-r13 RadioResourceConfigCommonSIB-NB-r13,

ue-TimersAndConstants-r13 UE-TimersAndConstants-NB-r13,

freqInfo-r13 SEQUENCE {

ul-CarrierFreq-r13 CarrierFreq-NB-r13 OPTIONAL, -- Need OP

additionalSpectrumEmission-r13 AdditionalSpectrumEmission

},

timeAlignmentTimerCommon-r13 TimeAlignmentTimer,

multiBandInfoList-r13 SEQUENCE (SIZE (1..maxMultiBands)) OF AdditionalSpectrumEmission OPTIONAL, -- Need OR

lateNonCriticalExtension OCTET STRING OPTIONAL,

...,

[[ cp-Reestablishment-r14 ENUMERATED {true} OPTIONAL -- Need OP

]],

[[ servingCellMeasInfo-r14 ENUMERATED {true} OPTIONAL, -- Need OR

cqi-Reporting-r14 ENUMERATED {true} OPTIONAL -- Need OR

]],

[[ enhancedPHR-r15 ENUMERATED {true} OPTIONAL, -- Need OR

freqInfo-v1530 SEQUENCE {

tdd-UL-DL-AlignmentOffset-r15 TDD-UL-DL-AlignmentOffset-NB-r15

} OPTIONAL, -- Cond TDD

cp-EDT-r15 ENUMERATED {true} OPTIONAL, -- Need OR

up-EDT-r15 ENUMERATED {true} OPTIONAL -- Need OR

]],

[[ earlySecurityReactivation-r16 ENUMERATED {true} OPTIONAL, -- Need OR

cp-EDT-5GC-r16 ENUMERATED {true} OPTIONAL, -- Need OR

up-EDT-5GC-r16 ENUMERATED {true} OPTIONAL, -- Need OR

cp-PUR-EPC-r16 ENUMERATED {true} OPTIONAL, -- Need OR

up-PUR-EPC-r16 ENUMERATED {true} OPTIONAL, -- Need OR

cp-PUR-5GC-r16 ENUMERATED {true} OPTIONAL, -- Need OR

up-PUR-5GC-r16 ENUMERATED {true} OPTIONAL, -- Need OR

rai-ActivationEnh-r16 ENUMERATED {true} OPTIONAL -- Need OR

]],

[[ gnss-PositionFixDurationReporting-r18 ENUMERATED {true} OPTIONAL -- Need OR

]],

[[ cp-CB-Msg3-EDT-r19 ENUMERATED {true} OPTIONAL, -- Need OR

up-CB-Msg3-EDT-r19 ENUMERATED {true} OPTIONAL -- Need OR

]]

}

-- ASN1STOP

| *SystemInformationBlockType2-NB* field descriptions |
| --- |
| ***additionalSpectrumEmission***  The UE requirements related to IE *AdditionalSpectrumEmission* are defined in TS 36.101 [42], clause 6.2.4F and TS 36.102 [113], clause 6.2B.3 for NTN capable UE. |
| ***cp-CB-Msg3-EDT***  This field indicates whether the UE is allowed to initiate CP-EDT using the CB-Msg3-EDT procedure in NTN, see 5.3.3.1b. |
| ***cp-EDT***  For FDD: This field indicates whether the UE is allowed to initiate CP-EDT when connected to EPC, see 5.3.3.1b. |
| ***cp-EDT-5GC***  For FDD: This field indicates whether the UE is allowed to initiate CP-EDT when connected to 5GC, see 5.3.3.1b. |
| ***cp-PUR-5GC***  For FDD: Indicates whether CP transmission using PUR is allowed in the cell when connected to 5GC, see 5.3.3.1c. |
| ***cp-PUR-EPC***  For FDD: Indicates whether CP transmission using PUR is allowed in the cell when connected to EPC, see 5.3.3.1c. |
| ***cp-Reestablishment***  This field indicates if the NB-IoT UE is allowed to trigger RRC connection re-establishment when AS security has not been activated. |
| ***cqi-Reporting***  For FDD: This field indicates if downlink channel quality reporting in *RRCConnectionReestablishmentRequest-NB, RRCConnectionRequest-NB, RRCConnectionResumeRequest-NB* and *RRCEarlyDataRequest-NB message* is allowed. |
| ***earlySecurityReactivation***  Indicates that early security reactivation when resuming a suspended RRC connection as specified in 5.3.3.18 is supported. |
| ***enhancedPHR***  For FDD: This field indicates if the NB-IoT UE is allowed to report enhanced PHR in MSG3 as specified in TS 36.321 [6]. |
| ***gnss-PositionFixDurationReporting***  If present, this field indicates that UEs capable of performing GNSS position fix in RRC\_CONNECTED are configured to include the time duration required to acquire a GNSS position in *RRCConnectionSetupComplete-NB*, *RRCConnectionResumeComplete-NB*, and *RRCConnectionReestablishmentComplete-NB*. |
| ***multiBandInfoList***  A list of *additionalSpectrumEmission* i.e. one for each additional frequency band included in *multiBandInfoList* in *SystemInformationBlockType1-NB,* listed in the same order*.* |
| ***rai-ActivationEnh***  Indicates whether the UE is allowed to report the AS Release Assistance Indication using the DCQR and AS RAI MAC CE as specified in TS 36.321 [6] when connected to EPC. |
| ***servingCellMeasInfo***  This field indicates if serving cell idle mode measurement reporting in *RRCConnectionReestablishmentComplete-NB*, *RRCConnectionResumeComplete-NB* and *RRCConnectionSetupComplete-NB* is allowed. |
| ***tdd-UL-DL-AlignmentOffset***  Indicates the offset between the UL carrier frequency center with respect to DL carrier frequency center for the anchor carrier. |
| ***ul-CarrierFreq***  For FDD: Uplink carrier frequency as defined in TS 36.101 [42], clause 5.7.3F and TS 36.102 [113], clause 5.4B.2. If *operationModeInfo* in the MIB-NB is set to *standalone* and the field is absent*,* thevalue of the carrier frequency is determined by the TX-RX frequency separation defined in TS 36.101 [42], table 5.7.4-1, and the value of the carrier frequency offset is 0. If *operationModeInfo* in the MIB-NB is not set to *standalone,* thefield is mandatory present.  For TDD: This field is absent and the uplink carrier frequency is same as the downlink frequency. |
| ***up-CB-Msg3-EDT***  This field indicates whether the UE is allowed to initiate UP-EDT using the CB-Msg3-EDT procedure in NTN, see 5.3.3.1b. |
| ***up-EDT***  For FDD: This field indicates whether the UE is allowed to initiate UP-EDT when connected to EPC, see 5.3.3.1b. |
| ***up-EDT-5GC***  For FDD: This field indicates whether the UE is allowed to initiate UP-EDT when connected to 5GC, see 5.3.3.1b. |
| ***up-PUR-5GC***  For FDD: Indicates whether UP transmission using PUR is allowed in the cell when connected to 5GC, see 5.3.3.1c. |
| ***up-PUR-EPC***  For FDD: Indicates whether UP transmission using PUR is allowed in the cell when connected to EPC, see 5.3.3.1c. |

| Conditional presence | Explanation |
| --- | --- |
| *TDD* | The field is mandatory present for TDD; otherwise the field is not present and the UE shall delete any existing value for this field. |

Next Change

#### 6.7.3.2 NB-IoT Radio resource control information elements

#### *– CB-Msg3-ConfigSIB-NB*

The IE *CB-Msg3-ConfigSIB-NB* is used to specify the CB-Msg3-EDT configuration.

*CB-Msg3-ConfigSIB-NB* information element

-- ASN1START

CB-Msg3-ConfigSIB-NB-r19 ::= SEQUENCE {

cb-Msg3-MinRSRP-Threshold-NB-r19 NRSRP-Range-NB-r14 OPTIONAL, --Need OR

cb-Msg3-RSRP-CE-Levels-NB-r19 CB-Msg3-RSRP-CE-Levels-NB-r19 OPTIONAL, --Need OR

cb-Msg3-ConfigList-NB-r19 CB-Msg3-ConfigList-NB-r19,

powerRampingParameters-NB-r19 PowerRampingParameters-NB-r19

}

CB-Msg3-ConfigList-NB-r19 ::= SEQUENCE (SIZE (1.. maxCE-Level-CB-Msg3-NB-r19)) OF

CB-Msg3-Config-NB-r19

CB-Msg3-Config-NB-r19 ::= SEQUENCE {

cb-Msg3-TBS-NB-r19 ENUMERATED {b144, b328, b408, b504, b584, b680, b808,

b936},

cb-Msg3-NumOfReplicas-NB-r19 INTEGER (1..4),

cb-Msg3-TimeResource-NB-r19 SEQUENCE {

npusch-Periodicity-r19 ENUMERATED {ms40, ms80, ms160, ms240,

ms320, ms640, ms1280, ms2560},

npusch-StartSFN-r19 INTEGER (0..1023),

npusch-StartSubframe-r19 INTEGER (0..9)

},

cb-Msg3-PhysicalConfig-r19 SEQUENCE {

npusch-NumRUsIndex-r19 INTEGER (0..7),

npusch-NumRepetitionsIndex-r19 INTEGER (0..7),

npusch-SubCarrierSetList-r19 CHOICE {

npusch-SubCarrierSetList-khz15 SEQUENCE (SIZE(1..12)) OF INTEGER (0..18),

npusch-SubCarrierSetList-khz3dot75 SEQUENCE (SIZE(1..48)) OF INTEGER (0..47)

},

npusch-MCS-r19 CHOICE {

singleTone INTEGER (0..10),

multiTone INTEGER (0..13)

},

ack-NumRepetitions-NB-r19 ACK-NACK-NumRepetitions-NB-r13,

p0-UE-NPUSCH-r19 INTEGER (-8..7),

alpha-NB-r19 ENUMERATED {al0, al04, al05, al06,

al07, al08, al09, al1},

npdcch-CarrierIndex-r19 INTEGER (1..maxNonAnchorCarriers-NB-r14)

OPTIONAL, -- Need OP

npdcch-NumRepetitions-r19 ENUMERATED {r1, r2, r4, r8, r16, r32, r64, r128,

r256, r512, r1024, r2048,

spare4, spare3, spare2, spare1},

npdcch-StartSF-CSS-r19 ENUMERATED {v1dot5, v2, v4, v8, v16, v32, v48, v64},

npdcch-Offset-CSS-r19 ENUMERATED {zero, oneEighth, oneFourth, threeEighth}

},

cb-Msg3-TxWindow-NB-r19 SEQUENCE {

windowSize-NB-r19 ENUMERATED {p4, p8, p12, p16, p20, n256,

p24, p28, p30},

windowPeriodicity-NB-r19 ENUMERATED { n16, n32, n48, n64, n128, n256,

n512， n1024}

} OPTIONAL, --Need OP

cb-Msg3-ResponseWindow-NB-r19 ENUMERATED {pp1, pp2, pp3, pp4, pp8, pp16, pp32,

pp64},

cb-Msg3-MaxAttemptNum-NB-r19 ENUMERATED {n2, n3, n4, n5, n6, n7, n8, n10} OPTIONAL, --Need OP

...

}

CB-Msg3-RSRP-CE-Levels-NB-r19 ::= SEQUENCE (SIZE(1..2)) OF RSRP-Range

NPUSCH-SubCarrierSet-r19 ::= CHOICE {

khz15 INTEGER (0..18),

khz3dot75 INTEGER (0..47)

}

PowerRampingParameters-NB-r19 ::= SEQUENCE {

PowerRampingStep-NB-r19 ENUMERATED {dB0, dB2, dB4, dB6},

cb-Msg3-InitialReceivedTargetPower-NB-r19 ENUMERATED {

dBm-130, dBm-128, dBm-126, dBm-124, dBm-122,

dBm-120, dBm-118, dBm-116, dBm-114, dBm-112,

dBm-110, dBm-108, dBm-106, dBm-104, dBm-102,

dBm-100, dBm-98, dBm-96, dBm-94, dBm-92, dBm-90,

dBm-88, dBm-86, dBm-84,dBm-82, dBm-80}

}

-- ASN1STOP

|  |
| --- |
| *CB-Msg3-ConfigSIB-NB* field descriptions |
| ***ack-NumRepetitions-NB***  Number of repetitions for the ACK resource unit carrying HARQ response to NPDSCH, see TS 36.213 [23], clause 16.4.2. |
| ***alpha-NB***  Parameter: *αc*(3). See TS 36.213 [23], clause 16.2.1.1.1. |
| ***cb-Msg3-ConfigList-NB***  CB-Msg3-EDT configuration for each CE level applicable to a UE performing CB-Msg3-EDT. The first entry in the list is the CB-Msg3-EDT configuration for CE level 0, the second entry in the list is the CB-Msg3-EDT configuration for CE level 1, and so on. For the *CB-Msg3-ConfigList-NB* in *SystemInformationBlockType22-NB*, E-UTRAN includes the same number of entries, and listed in the same order, as in *CB-Msg3-ConfigList-NB* in *SystemInformationBlockType2-NB.* |
| ***cb-Msg3-InitialReceivedTargetPower-NB***  Initial power for CB-Msg3 transmission as specified in TS 36.321 [6]. Value in dBm. Value dBm-130 corresponds to -130 dBm, dBm-128 corresponds to -128 dBm and so on. |
| ***cb-Msg3-MaxAttemptNum-NB***  The maximum number of attempts of CB-Msg3-EDT within this CE level. If the field is absent, the UE shall assume no re-attempt. |
| ***cb-Msg3-MinRSRP-Threshold-NB***  Indicates the minimum RSRP threshold for initiating CB-Msg3-EDT. |
| ***cb-Msg3-NumOfReplicas-NB***  Indicates the number of replicas that UE should send within one attempt of CB-Msg3-EDT. |
| ***cb-Msg3-ResponseWindow-NB***  NPDCCH search space window duration. See TS 36.321 [6] and TS 36.213 [23]. Value pp1 corresponds to 1 PDCCH period, pp2 corresponds to 2 PDCCH periods and so on. The value considered by the UE is: *cb-Msg3-ResponseWindow-NB* = Min (signaled value x PDCCH period, 10.24s). |
| ***cb-Msg3-RSRP-CE-Levels-NB***  RSRP thresholds for determing which configuration is used for CB-Msg3-EDT. |
| ***cb-Msg3-TBS-NB***  Indicates the TB size threshold for initiating CB-Msg3-EDT. Value b144 corresponds to 144 bits, value b328 corresponds to 328 bits and so on. See TS 36.213 [23]. |
| ***cb-Msg3-TxWindow-NB***  CB-Msg3 transmission window configuration. The start time of the CB-Msg3 transmission window is aligned with the NPUSCH start time indicated by *npusch-StartSFN-r19* and *npusch-StartSubframe-r19*. When *cb-Msg3-NumOfReplicas-NB-r19* equals 1, this field is absent. For *windowSize*,value *p4* corresponds to 4 PUSCH periods, *p8* corresponds to 8 PUSCH periods and so on. For *windowPeriodicity*,value *n16* corresponds to 160ms, *n32* corresponds to 320ms and so on. |
| ***npdcch-CarrierIndex***  Indicates the non-anchor carrier for receiving CB-Msg4. If this field is absent, UE receives CB-Msg4 on the anchor carrier. |
| ***npdcch-Offset-CSS***  Fractional period offset of starting subframe for an NPDCCH common search space, see TS 36.213 [23], clause 16.6. |
| ***npdcch-StartSF-CSS***  Starting subframe configuration for an NPDCCH common search space, see TS 36.213 [23], clause 16.6. Value v1dot5 corresponds to 1.5, value 2 corresponds to 2 and so on. |
| ***npusch-MCS***  Index to tables specified in TS 36.213 [23], Table 16.5.1.2-1 and Table 16.5.1.2-2 for single tone and multi tone respectively, that defines modulation and TBS index for NPUSCH for CB-Msg3-EDT. |
| ***npusch-NumRepetitionsIndex***  Index to a table specified in TS 36.213 [23], Table 16.5.1.1-3, that defines number of repetitions for NPUSCH for CB-Msg3-EDT. |
| ***npusch-NumRUsIndex***  Index to a table specified in TS 36.213 [23], Table 16.5.1.1-2, that defines number of resource units for NPUSCH for CB-Msg3-EDT. |
| ***npusch-SubCarrierSetList***  For NPUSCH transmission with subcarrier spacing 3.75 kHz, indicates the subcarrier used for CB-Msg3-EDT, as specified in TS 36.213 [23].  For NPUSCH transmission with subcarrier spacing 15 kHz, indicates the index to Table 16.5.1.1-1 specified in TS 36.213 [23], which defines the set of subcarriers for NPUSCH for CB-Msg3-EDT. |
| ***p0-UE-NPUSCH***  Parameter: P0\_UE\_PUSCH,c (3). See TS 36.213 [23], clause 16.2.1.1.1, unit dB. |
| ***powerRampingStep-NB***  Power ramping factor in TS 36.321 [6]. Value in dB. Value dB0 corresponds to 0 dB, dB2 corresponds to 2 dB and so on. |

Next Change

#### 6.7.3.6 NB-IoT Other information elements

#### – *UE-Capability-NB*

The IE *UE-Capability-NB* is used to convey the NB-IoT UE Radio Access Capability Parameters, see TS 36.306 [5]. The IE *UE-Capability-NB* is transferred in NB-IoT only.

*UE-Capability-NB* information element

-- ASN1START

UE-Capability-NB-r13 ::= SEQUENCE {

accessStratumRelease-r13 AccessStratumRelease-NB-r13,

ue-Category-NB-r13 ENUMERATED {nb1} OPTIONAL,

multipleDRB-r13 ENUMERATED {supported} OPTIONAL,

pdcp-Parameters-r13 PDCP-Parameters-NB-r13 OPTIONAL,

phyLayerParameters-r13 PhyLayerParameters-NB-r13,

rf-Parameters-r13 RF-Parameters-NB-r13,

dummy SEQUENCE {} OPTIONAL

}

UE-Capability-NB-Ext-r14-IEs ::= SEQUENCE {

ue-Category-NB-r14 ENUMERATED {nb2} OPTIONAL,

mac-Parameters-r14 MAC-Parameters-NB-r14 OPTIONAL,

phyLayerParameters-v1430 PhyLayerParameters-NB-v1430 OPTIONAL,

rf-Parameters-v1430 RF-Parameters-NB-v1430,

nonCriticalExtension UE-Capability-NB-v1440-IEs OPTIONAL

}

UE-Capability-NB-v1440-IEs ::= SEQUENCE {

phyLayerParameters-v1440 PhyLayerParameters-NB-v1440 OPTIONAL,

nonCriticalExtension UE-Capability-NB-v14x0-IEs OPTIONAL

}

UE-Capability-NB-v14x0-IEs ::= SEQUENCE {

-- Following field is only to be used for late REL-14 extensions

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension UE-Capability-NB-v1530-IEs OPTIONAL

}

UE-Capability-NB-v1530-IEs ::= SEQUENCE {

earlyData-UP-r15 ENUMERATED {supported} OPTIONAL,

rlc-Parameters-r15 RLC-Parameters-NB-r15,

mac-Parameters-v1530 MAC-Parameters-NB-v1530,

phyLayerParameters-v1530 PhyLayerParameters-NB-v1530 OPTIONAL,

tdd-UE-Capability-r15 TDD-UE-Capability-NB-r15 OPTIONAL,

nonCriticalExtension UE-Capability-NB-v15x0-IEs OPTIONAL

}

UE-Capability-NB-v15x0-IEs ::= SEQUENCE {

-- Following field is only to be used for late REL-15 extensions

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension UE-Capability-NB-v1610-IEs OPTIONAL

}

UE-Capability-NB-v1610-IEs ::= SEQUENCE {

earlySecurityReactivation-r16 ENUMERATED {supported} OPTIONAL,

earlyData-UP-5GC-r16 ENUMERATED {supported} OPTIONAL,

pur-Parameters-r16 PUR-Parameters-NB-r16 OPTIONAL,

mac-Parameters-v1610 MAC-Parameters-NB-v1610,

phyLayerParameters-v1610 PhyLayerParameters-NB-v1610 OPTIONAL,

son-Parameters-r16 SON-Parameters-NB-r16 OPTIONAL,

measParameters-r16 MeasParameters-NB-r16,

tdd-UE-Capability-v1610 TDD-UE-Capability-NB-v1610 OPTIONAL,

nonCriticalExtension UE-Capability-NB-v16x0-IEs OPTIONAL

}

UE-Capability-NB-v16x0-IEs ::= SEQUENCE {

-- Following field is only to be used for late REL-16 extensions

lateNonCriticalExtension OCTET STRING (CONTAINING UE-EUTRA-Capability-v16f0-IEs) OPTIONAL,

nonCriticalExtension UE-Capability-NB-v1700-IEs OPTIONAL

}

-- Late non-critical extensions

UE-EUTRA-Capability-v16f0-IEs ::= SEQUENCE {

son-Parameters-v16f0 SON-Parameters-NB-v16f0,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- Regular non-critical extensions

UE-Capability-NB-v1700-IEs ::= SEQUENCE {

coverageBasedPaging-r17 ENUMERATED {supported} OPTIONAL,

phyLayerParameters-v1700 PhyLayerParameters-NB-v1700,

ntn-Parameters-r17 NTN-Parameters-NB-r17 OPTIONAL,

nonCriticalExtension UE-Capability-NB-v1710-IEs OPTIONAL

}

UE-Capability-NB-v1710-IEs ::= SEQUENCE {

measParameters-v1710 MeasParameters-NB-v1710 OPTIONAL,

rf-Parameters-v1710 RF-Parameters-NB-v1710,

tdd-UE-Capability-v1710 TDD-UE-Capability-NB-v1710,

nonCriticalExtension UE-Capability-NB-v1720-IEs OPTIONAL

}

UE-Capability-NB-v1720-IEs ::= SEQUENCE {

ntn-Parameters-v1720 NTN-Parameters-NB-v1720,

nonCriticalExtension UE-Capability-NB-v1800-IEs OPTIONAL

}

UE-Capability-NB-v1800-IEs ::= SEQUENCE {

ntn-Parameters-v1800 NTN-Parameters-NB-v1800 OPTIONAL,

nonCriticalExtension UE-Capability-NB-v1900-IEs OPTIONAL

}

UE-Capability-NB-v1900-IEs ::= SEQUENCE {

pws-Support-r19 ENUMERATED {supported} OPTIONAL,

ntn-Parameters-v1900 NTN-Parameters-NB-v1900 OPTIONAL,

other-Parameters-r19 Other-Parameters-NB-r19,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

TDD-UE-Capability-NB-r15 ::= SEQUENCE {

ue-Category-NB-r15 ENUMERATED {nb2} OPTIONAL,

phyLayerParametersRel13-r15 PhyLayerParameters-NB-r13 OPTIONAL,

phyLayerParametersRel14-r15 PhyLayerParameters-NB-v1430 OPTIONAL,

phyLayerParameters-v1530 PhyLayerParameters-NB-v1530 OPTIONAL,

...

}

TDD-UE-Capability-NB-v1610 ::= SEQUENCE {

slotSymbolResourceResvDL-r16 ENUMERATED {supported} OPTIONAL,

slotSymbolResourceResvUL-r16 ENUMERATED {supported} OPTIONAL,

subframeResourceResvDL-r16 ENUMERATED {supported} OPTIONAL,

subframeResourceResvUL-r16 ENUMERATED {supported} OPTIONAL

}

TDD-UE-Capability-NB-v1710 ::= SEQUENCE {

phyLayerParameters-v1710 PhyLayerParameters-NB-v1700 OPTIONAL

}

AccessStratumRelease-NB-r13 ::= ENUMERATED {rel13, rel14, rel15, rel16, rel17, rel18, rel19, spare1, ...}

PDCP-Parameters-NB-r13 ::= SEQUENCE {

supportedROHC-Profiles-r13 SEQUENCE {

profile0x0002 BOOLEAN,

profile0x0003 BOOLEAN,

profile0x0004 BOOLEAN,

profile0x0006 BOOLEAN,

profile0x0102 BOOLEAN,

profile0x0103 BOOLEAN,

profile0x0104 BOOLEAN

},

maxNumberROHC-ContextSessions-r13 ENUMERATED {cs2, cs4, cs8, cs12} DEFAULT cs2,

...

}

RLC-Parameters-NB-r15 ::= SEQUENCE {

rlc-UM-r15 ENUMERATED {supported} OPTIONAL

}

MAC-Parameters-NB-r14 ::= SEQUENCE {

dataInactMon-r14 ENUMERATED {supported} OPTIONAL,

rai-Support-r14 ENUMERATED {supported} OPTIONAL

}

MAC-Parameters-NB-v1530 ::= SEQUENCE {

sr-SPS-BSR-r15 ENUMERATED {supported} OPTIONAL

}

MAC-Parameters-NB-v1610 ::= SEQUENCE {

rai-SupportEnh-r16 ENUMERATED {supported} OPTIONAL

}

NTN-Parameters-NB-r17 ::= SEQUENCE {

ntn-Connectivity-EPC-r17 ENUMERATED {supported} OPTIONAL,

ntn-TA-Report-r17 ENUMERATED {supported} OPTIONAL,

ntn-PUR-TimerDelay-r17 ENUMERATED {supported} OPTIONAL,

ntn-OffsetTimingEnh-r17 ENUMERATED {supported} OPTIONAL,

ntn-ScenarioSupport-r17 ENUMERATED {ngso,gso} OPTIONAL

}

NTN-Parameters-NB-v1720 ::= SEQUENCE {

ntn-SegmentedPrecompensationGaps-r17 ENUMERATED {sym1,sl1,sl2} OPTIONAL

}

NTN-Parameters-NB-v1800 ::= SEQUENCE {

ntn-LocationBasedMeasTrigger-EFC-r18 ENUMERATED {supported} OPTIONAL,

ntn-LocationBasedMeasTrigger-EMC-r18 ENUMERATED {supported} OPTIONAL,

ntn-TimeBasedMeasTrigger-r18 ENUMERATED {supported} OPTIONAL,

ntn-RRC-HarqDisableSingleTB-r18 ENUMERATED {supported} OPTIONAL,

ntn-OverriddenHarqDisableSingleTB-r18 ENUMERATED {supported} OPTIONAL,

ntn-DCI-HarqDisableSingleTB-r18 ENUMERATED {supported} OPTIONAL,

ntn-RRC-HarqDisableMultiTB-r18 ENUMERATED {supported} OPTIONAL,

ntn-OverriddenHarqDisableMultiTB-r18 ENUMERATED {supported} OPTIONAL,

ntn-DCI-HarqDisableMultiTB-r18 ENUMERATED {supported} OPTIONAL,

ntn-UplinkHarq-ModeB-SingleTB-r18 ENUMERATED {supported} OPTIONAL,

ntn-UplinkHarq-ModeB-MultiTB-r18 ENUMERATED {supported} OPTIONAL,

ntn-HarqEnhScenarioSupport-r18 ENUMERATED {ngso,gso} OPTIONAL,

ntn-Triggered-GNSS-Fix-r18 ENUMERATED {supported} OPTIONAL,

ntn-Autonomous-GNSS-Fix-r18 ENUMERATED {supported} OPTIONAL,

ntn-UplinkTxExtension-r18 ENUMERATED {supported} OPTIONAL,

ntn-GNSS-EnhScenarioSupport-r18 ENUMERATED {ngso,gso} OPTIONAL

}

NTN-Parameters-NB-v1900 ::= SEQUENCE {

ntn-MO-CB-Msg3-EDT-UP-r19 ENUMERATED {supported} OPTIONAL,

ntn-OCC-SingleTone-khz3dot75-r19 ENUMERATED {supported} OPTIONAL,

ntn-OCC-SingleTone-khz15-r19 ENUMERATED {supported} OPTIONAL,

ntn-OCC-EnhScenarioSupport-r19 ENUMERATED {ngso,gso} OPTIONAL

}

MeasParameters-NB-r16 ::= SEQUENCE {

dl-ChannelQualityReporting-r16 ENUMERATED {supported} OPTIONAL

}

MeasParameters-NB-v1710 ::= SEQUENCE {

connModeMeasIntraFreq-r17 ENUMERATED {supported} OPTIONAL,

connModeMeasInterFreq-r17 ENUMERATED {supported} OPTIONAL

}

PhyLayerParameters-NB-r13 ::= SEQUENCE {

multiTone-r13 ENUMERATED {supported} OPTIONAL,

multiCarrier-r13 ENUMERATED {supported} OPTIONAL

}

PhyLayerParameters-NB-v1430 ::= SEQUENCE {

multiCarrier-NPRACH-r14 ENUMERATED {supported} OPTIONAL,

twoHARQ-Processes-r14 ENUMERATED {supported} OPTIONAL

}

PhyLayerParameters-NB-v1440 ::= SEQUENCE {

interferenceRandomisation-r14 ENUMERATED {supported} OPTIONAL

}

PhyLayerParameters-NB-v1530 ::= SEQUENCE {

mixedOperationMode-r15 ENUMERATED {supported} OPTIONAL,

sr-WithHARQ-ACK-r15 ENUMERATED {supported} OPTIONAL,

sr-WithoutHARQ-ACK-r15 ENUMERATED {supported} OPTIONAL,

nprach-Format2-r15 ENUMERATED {supported} OPTIONAL,

additionalTransmissionSIB1-r15 ENUMERATED {supported} OPTIONAL,

npusch-3dot75kHz-SCS-TDD-r15 ENUMERATED {supported} OPTIONAL

}

PhyLayerParameters-NB-v1610 ::= SEQUENCE {

npdsch-MultiTB-r16 ENUMERATED {supported} OPTIONAL,

npdsch-MultiTB-Interleaving-r16 ENUMERATED {supported} OPTIONAL,

npusch-MultiTB-r16 ENUMERATED {supported} OPTIONAL,

npusch-MultiTB-Interleaving-r16 ENUMERATED {supported} OPTIONAL,

multiTB-HARQ-AckBundling-r16 ENUMERATED {supported} OPTIONAL,

slotSymbolResourceResvDL-r16 ENUMERATED {supported} OPTIONAL,

slotSymbolResourceResvUL-r16 ENUMERATED {supported} OPTIONAL,

subframeResourceResvDL-r16 ENUMERATED {supported} OPTIONAL,

subframeResourceResvUL-r16 ENUMERATED {supported} OPTIONAL

}

PUR-Parameters-NB-r16 ::= SEQUENCE {

pur-CP-EPC-r16 ENUMERATED {supported} OPTIONAL,

pur-CP-5GC-r16 ENUMERATED {supported} OPTIONAL,

pur-UP-EPC-r16 ENUMERATED {supported} OPTIONAL,

pur-UP-5GC-r16 ENUMERATED {supported} OPTIONAL,

pur-NRSRP-Validation-r16 ENUMERATED {supported} OPTIONAL,

pur-CP-L1Ack-r16 ENUMERATED {supported} OPTIONAL

}

Other-Parameters-NB-r19 ::= SEQUENCE {

ntn-Redirection-r19 ENUMERATED {supported} OPTIONAL

}

PhyLayerParameters-NB-v1700 ::= SEQUENCE {

npdsch-16QAM-r17 ENUMERATED {supported} OPTIONAL

}

RF-Parameters-NB-r13 ::= SEQUENCE {

supportedBandList-r13 SupportedBandList-NB-r13,

multiNS-Pmax-r13 ENUMERATED {supported} OPTIONAL

}

RF-Parameters-NB-v1430 ::= SEQUENCE {

powerClassNB-14dBm-r14 ENUMERATED {supported} OPTIONAL

}

RF-Parameters-NB-v1710 ::= SEQUENCE {

supportedBandList-v1710 SupportedBandList-NB-v1710 OPTIONAL

}

SupportedBandList-NB-r13 ::= SEQUENCE (SIZE (1..maxBands)) OF SupportedBand-NB-r13

SupportedBandList-NB-v1710 ::= SEQUENCE (SIZE (1..maxBands)) OF SupportedBand-NB-v1710

SupportedBand-NB-r13 ::= SEQUENCE {

band-r13 FreqBandIndicator-NB-r13,

powerClassNB-20dBm-r13 ENUMERATED {supported} OPTIONAL

}

SupportedBand-NB-v1710 ::= SEQUENCE {

npusch-16QAM-r17 ENUMERATED {supported} OPTIONAL

}

SON-Parameters-NB-r16 ::= SEQUENCE {

anr-Report-r16 ENUMERATED {supported} OPTIONAL,

rach-Report-r16 ENUMERATED {supported} OPTIONAL

}

SON-Parameters-NB-v16f0 ::= SEQUENCE {

locationInfo-r16 ENUMERATED {supported} OPTIONAL

}

-- ASN1STOP

| *UE-Capability-NB* field descriptions | *FDD/TDD appl* | *FDD/TDD diff* |
| --- | --- | --- |
| ***accessStratumRelease***  This field indicates the release supported by the UE. | FDD/TDD | No |
| ***additionalTransmissionSIB1***  Indicates whether the UE supports additional SIB1 transmission as specified in TS 36.213 [23]. | FDD | - |
| ***anr-Report***  Indicates whether the UE supports ANR measurements in RRC\_IDLE. | FDD/TDD | No |
| ***connModeMeasIntraFreq, connModeMeasInterFreq***  Indicates whether the UE in RRC\_CONNECTED supports neighbour cell measurements. | FDD/TDD | No |
| ***coverageBasedPaging***  Indicates whether the UE in RRC\_IDLE supports coverage based paging carrier selection as defined in TS 36.304 [4]. | FDD/TDD | No |
| ***dataInactMon***  Indicates whether the UE supports the data inactivity monitoring as specified in TS 36.321 [6]. | FDD/TDD | No |
| ***dl-ChannelQualityReporting-r16***  Indicates whether the UE supports DL channel quality reporting in connected mode as specified in TS 36.321 [6]. | FDD | - |
| ***dummy***  This field is not used in the specification. It shall not be sent by the UE. | NA | NA |
| ***earlyData-UP, earlyData-UP-5GC***  Indicates whether the UE supports EDT for User plane CIoT EPS/5GS optimisations, as defined in TS 24.301 [35] and TS 24.501 [95] respectively. | FDD | - |
| ***earlySecurityReactivation***  Indicates whether the UE supports early security reactivation when resuming a suspended RRC connection. | FDD/TDD | No |
| ***interferenceRandomisation***  For FDD: Indicates whether the UE supports interference randomisation in connected mode as defined in TS.36.211 [21]. | FDD | - |
| ***locationInfo***  Indicates whether the UE supports reporting of *locationInfo* in RLF report. | FDD/TDD | No |
| ***maxNumberROHC-ContextSessions***  Set to the maximum number of concurrently active ROHC contexts supported by the UE, excluding context sessions that leave all headers uncompressed. cs2 corresponds with 2 (context sessions), cs4 corresponds with 4 and so on. The network ignores this field if the UE supports none of the ROHC profiles in *supportedROHC-Profiles*. | FDD/TDD | No |
| ***mixedOperationMode***  Defines whether the UE supports multi-carrier operation with mixed operation mode, standalone or inband/guardband, between the anchor carrier and the non-anchor carrier for unicast, paging, and random access as specified in TS 36.300 [9]. | FDD | - |
| ***multiCarrier***  Defines whether the UE supports multi -carrier operation. | FDD/TDD | Yes |
| ***multicarrier-NPRACH***  Defines whether the UE supports NPRACH on non-anchor carrier as specified in TS 36.321 [6]. | FDD/TDD | Yes |
| ***multipleDRB***  Defines whether the UE supports multiple DRBs. | FDD/TDD | No |
| ***multiNS-Pmax***  Defines whether the UE supports the mechanisms defined for NB-IoT cells broadcasting *NS-PmaxList-NB*. | FDD/TDD | No |
| ***multiTB-HARQ-AckBundling***  Indicates whether the UE supports HARQ ACK bundling for interleaved transmission for DL.  If *multiTB-HARQ-AckBundling* is included, the UE shall also indicate support for *npdsch-MultiTB-Interleaving*. | FDD | - |
| ***multiTone***  Defines whether the UE supports UL multi-tone transmissions on NPUSCH. | FDD/TDD | Yes |
| ***npdsch-16QAM***  Indicates whether the UE supports 16QAM for DL unicast as defined in TS 36.213 [23]. | FDD/TDD | Yes |
| ***npdsch-MultiTB***  Indicates whether the UE supports multiple TBs scheduling in RRC\_CONNECTED for DL.  If *npdsch-MultiTB* is included, the UE shall also indicate support for *twoHARQ-Processes*. | FDD | - |
| ***npdsch-MultiTB-Interleaving***  Indicates whether the UE supports interleaved transmission when multiple TBs is scheduled in RRC\_CONNECTED for DL. | FDD | - |
| ***nprach-Format2***  Defines whether the UE supports NPRACH resources using preamble format 2. | FDD | - |
| ***npusch-16QAM***  Indicates whether the UE supports 16QAM for UL unicast on the band as defined in TS 36.213 [23]. | FDD/TDD | No |
| ***npusch-3dot75kHz-SCS-TDD***  Indicates whether the UE supports NPUSCH with 3.75kHz SCS for TDD. | TDD | - |
| ***npusch-MultiTB***  Indicates whether the UE supports multiple TBs scheduling in RRC\_CONNECTED for UL.  If *npusch-MultiTB* is included, the UE shall also indicate support for *twoHARQ-Processes*. | FDD | - |
| ***npusch-MultiTB-Interleaving***  Indicates whether the UE supports interleaved transmission when multiple TBs is scheduled in RRC\_CONNECTED for UL. | FDD | - |
| ***ntn-Autonomous-GNSS-Fix***  This field indicates whether the UE supports autonomous GNSS position fix in RRC\_CONNECTED. | FDD | - |
| ***ntn-Connectivity-EPC***  Indicates whether the UE supports NTN access when connected to EPC. If the UE indicates this capability, the UE shall support all NTN essential features as specified in TS 36.306 [5]. | FDD | - |
| ***ntn-DCI-HarqDisableMultiTB***  This field indicates whether the UE supports DCI-based HARQ feedback disabling for downlink transmission when HARQ feedback disabling per HARQ process for downlink transmission is not configured by RRC and when configured with *npdsch-MultiTB-Config*. | FDD | - |
| ***ntn-DCI-HarqDisableSingleTB***  This field indicates whether the UE supports DCI-based HARQ feedback disabling for downlink transmission when HARQ feedback disabling per HARQ process for downlink transmission is not configured by RRC. | FDD | - |
| ***ntn-GNSS-EnhScenarioSupport***  This field indicates whether the UE supports GNSS measurement and UL transmission extension enhancements in RRC\_CONNECTED for only GSO or NGSO scenario. If this field is not included, the GNSS measurement and UL transmission extension enhancements in RRC\_CONNECTED that are indicated as supported are applicable for both GSO and NGSO scenario. | FDD | - |
| ***ntn-HarqEnhScenarioSupport***  This field indicates whether the UE supports UL and DL HARQ process enhancements for only GSO or NGSO scenario. If this field is not included, the UL and DL HARQ process enhancements that are indicated as supported are applicable for both GSO and NGSO scenario. | FDD | - |
| ***ntn-LocationBasedMeasTrigger-EFC***  This field indicates whether the UE supports location-based measurement trigger in RRC\_CONNECTED in earth fixed cell. | FDD | - |
| ***ntn-LocationBasedMeasTrigger-EMC***  This field indicates whether the UE supports location-based measurement trigger in RRC\_CONNECTED in earth moving cell. | FDD | - |
| ***ntn-MO-CB-Msg3-EDT-UP***  This field indicates whether the UE supports contention-based Msg3 EDT for User Plane CIoT EPS optimizations. | FDD | - |
| ***ntn-OCC-EnhScenarioSupport***  This field indicates whether the OCC enhancements in RRC\_CONNECTED that are indicated as supported are applicable in GSO scenario or NGSO scenario for UE indicating support of both GSO and NGSO scenarios. If this field is not included, the OCC enhancements in RRC\_CONNECTED that are indicated as supported are applicable in both GSO and NGSO scenarios. | FDD | - |
| ***ntn-OCC-SingleTone-khz15***  This field indicates whether the UE supports OCC for single-tone NPUSCH format 1 with 15 kHz SCS in RRC\_CONNECTED. | FDD | - |
| ***ntn-OCC-SingleTone-khz3dot75***  This field indicates whether the UE supports OCC for single-tone NPUSCH format 1 with 3.75 kHz SCS in RRC\_CONNECTED. | FDD | - |
| ***ntn-OffsetTimingEnh***  Indicates whether the UE supports timing relationship enhancement using *Differential Koffset* as specified in TS 36.321 [6] and TS 36.213 [23]. | FDD | - |
| ***ntn-OverriddenHarqDisableMultiTB***  This field indicates whether the UE supports DCI-based HARQ feedback disabling for downlink transmission by overriding the RRC configuration when configured with *npdsch-MultiTB-Config*. | FDD | - |
| ***ntn-OverriddenHarqDisableSingleTB***  This field indicates whether the UE supports DCI-based HARQ feedback disabling for downlink transmission by overriding the RRC configuration. | FDD | - |
| ***ntn-PUR-TimerDelay***  Indicates whether the UE supports delaying the start of the *pur-ResponseWindowTimer* for NTN, see TS 36.321 [6]. | FDD |  |
| ***ntn-Redirection***  Indicates whether the UE supports redirection from a terrestrial network to a non-terrestrial network. | FDD/TDD | No |
| ***ntn-RRC-HarqDisableMultiTB***  This field indicates whether the UE supports HARQ feedback disabling per HARQ process for downlink transmission by RRC configuration when configured with *npdsch-MultiTB-Config*. | FDD | - |
| ***ntn-RRC-HarqDisableSingleTB***  This field indicates whether the UE supports HARQ feedback disabling per HARQ process for downlink transmission by RRC configuration. | FDD | - |
| ***ntn-SegmentedPrecompensationGaps***  Indicates the minimum supported gap length between segments for segmented uplink transmission. Value *sym1* corresponds to 1 symbol, value *sl1* corresponds to 1 slot, value *sl2* corresponds to 2 slots. | FDD | - |
| ***ntn-ScenarioSupport***  Indicates whether the UE supports NTN features for only GSO or NGSO scenario. If a UE does not include this field but includes *ntn-Connectivity-EPC-r17*, the UE supports the NTN features for both GSO and NGSO scenarios. | FDD | - |
| ***ntn-TA-report***  Indicates whether the UE supports timing advance reporting in RRC\_CONNECTED, see TS 36.321 [6]. | FDD | - |
| ***ntn-TimeBasedMeasTrigger***  This field indicates whether the UE supports time-based measurement trigger in RRC\_CONNECTED. | FDD | - |
| ***ntn-Triggered-GNSS-Fix***  This field indicates whether the UE supports network triggered GNSS position fix in RRC\_CONNECTED. | FDD | - |
| ***ntn-UplinkHarq-ModeB-MultiTB***  This field indicates whether the UE supports HARQ Mode B when scheduled with uplink transmission of multiple TBs. | FDD | - |
| ***ntn-UplinkHarq-ModeB-SingleTB***  This field indicates whether the UE supports HARQ Mode B. | FDD | - |
| ***ntn-UplinkTxExtension***  This field indicates whether the UE supports to perform UL transmission in a duration after original GNSS validity duration expires without GNSS re-acquisition. | FDD | - |
| ***powerClassNB-14dBm***  Defines whether the UE supports power class 14dBm in all the bands supported by the UE as specified in TS 36.101 [42].  If *powerClassNB-20dBm* is included, the UE shall not include the field *powerClassNB-14dBm*. | FDD/TDD | No |
| ***powerClassNB-20dBm***  Defines whether the UE supports power class 20dBm in NB-IoT for the band, as specified in TS 36.101 [42] and TS 36.102 [113] for NTN capable UE. If neither *powerClassNB-14dBm* nor *powerClassNB-20dBm* is included, UE supports power class 23 dBm in the NB-IoT band. | FDD/TDD | No |
| ***pur-CP-EPC*, *pur-CP-5GC***  Indicates whether the UE supports transmission using PUR for Control plane CIoT EPS/5GS optimisations, as defined in TS 24.301 [35] and TS 24.501 [95] respectively. | FDD | - |
| ***pur-CP-L1Ack***  Indicates whether UE supports L1 acknowledgement in response to CP transmission using PUR.  If *pur-CP-L1Ack* is included, the UE shall also indicate support for *pur-CP-EPC* or *pur-CP-5GC*. | FDD | - |
| ***pur-NRSRP-Validation***  Indicates whether UE supports serving cell NRSRP for TA validation for transmission using PUR.  If *pur-NRSRP-Validation* is included, the UE shall also indicate support for *pur-CP-EPC*, *pur-CP-5GC*, *pur-UP-EPC* or *pur-CP-5GC*. | FDD | - |
| ***pur-UP-EPC*, *pur-UP-5GC***  Indicates whether the UE supports transmission using PUR for User plane CIoT EPS/5GS optimisations, as defined in TS 24.301 [35] and TS 24.501 [95] repectively. | FDD | - |
| ***pws-Support***  This field indicates whether the UE supports the reception of PWS message including ETWS, CMAS, KPAS, EU-Alert in RRC\_IDLE. In TN, there is no TDD/FDD differentiation for indicating this field. | FDD | - |
| ***rach-Report***  Indicates whether the UE supports delivery of *rach-Report*. | FDD/TDD | No |
| ***rai-Support***  Defines whether the UE supports release assistance indication (RAI) as specified in TS 36.321 [6]. | FDD/TDD | No |
| ***rai-SupportEnh***  Indicates whether the UE supports AS Release Assistance Indication via the DCQR and AS RAI MAC CE when connected to EPC as specified in TS 36.321 [6]. | FDD/TDD | No |
| ***rlc-UM***  Defines whether the UE supports RLC UM as specified in TS 36.322 [7]. | FDD/TDD | No |
| ***slotSymbolResourceResvDL***  Indicates whether the UE supports slot/symbol-level time-domain DL resource reservation, e.g. for NB-IoT coexistence with NR.  If *slotSymbolResourceResvDL* is included, the UE shall also indicate support for *subframeResourceResvDL*. | FDD/TDD | Yes |
| ***slotSymbolResourceResvUL***  Indicates whether the UE supports slot/symbol-level time-domain UL resource reservation, e.g. for NB-IoT coexistence with NR.  If *slotSymbolResourceResvUL* is included, the UE shall also indicate support for *subframeResourceResvUL*. | FDD/TDD | Yes |
| ***supportedBandList, supportedBandList*-v1710**  Includes the supported NB-IoT bands as defined in TS 36.101 [42] and TS 36.102 [113] for NTN capable UE. If *supportedBandList-v1710* is included, the UE shall include the same number of entries, and listed in the same order, as in *supportedBandList-r13*. | FDD/TDD | No |
| ***sr-SPS-BSR***  Defines whether the UE supports SR using SPS BSR as specified in TS 36.321 [6]. | FDD | - |
| ***sr-withHARQ-ACK***  Defines whether the UE supports physical layer SR with HARQ ACK as specified in TS 36.213 [23]. | FDD | - |
| ***sr-withoutHARQ-ACK***  Defines whether the UE supports physical layer SR without HARQ ACK as specified in TS 36.211 [21] and TS 36.213 [23]. | FDD | - |
| ***subframeResourceResvDL***  Indicates whether the UE supports subframe-level time-domain DL resource reservation, e.g. for NB-IoT coexistence with NR. | FDD/TDD | Yes |
| ***subframeResourceResvUL***  Indicates whether the UE supports subframe-level time-domain UL resource reservation, e.g. for NB-IoT coexistence with NR. | FDD/TDD | Yes |
| ***supportedROHC-Profiles***  List of supported ROHC profiles as defined in TS 36.323 [8]. | FDD/TDD | No |
| ***twoHARQ-Processes***  Defines whether the UE supports two HARQ processes operation in DL and UL as specified in TS 36.212 [22] and TS 36.213 [23]. | FDD/TDD | Yes |
| ***ue-Category-NB***  UE category as defined in TS 36.306 [5]. Value nb1 corresponds to UE category NB1, value nb2 corresponds to UE category NB2.  A UE shall always include the field *ue-Category-NB-r13* in this version of the specification. | FDD/TDD | Yes |

NOTE 1: The IE *UE-Capability-NB* does not include AS security capability information, since these are the same as the security capabilities that are signalled by NAS. Consequently AS need not provide "man-in-the-middle" protection for the security capabilities.

NOTE 2: The column 'FDD/TDD appl' indicates the applicability to the xDD mode: 'FDD' means applicable to FDD only, 'TDD' means applicable to TDD only and 'FDD/TDD' means applicable to FDD and TDD.

NOTE 3: The column 'FDD/TDD diff' indicates if the UE is allowed to signal a different value for FDD and TDD when the capability applies to both FDD and TDD modes. '-' is used when the capability applies to one mode only, 'No' is used for dual mode capabilities where a common value is signalled for both modes, and 'Yes' is used for dual mode capabilities where a separate value is signalled for each mode. Common capabilities and FDD capabilities are reported in the fields of *UE-Capability-NB* except field *tdd-UE-Capability.* TDD capabilities are reported in *tdd-UE-Capability*.

End of Change