**3GPP TSG-RAN2 Meeting #109bis-e**  ***DRAFT R2-20xx***

**Online, 20-30 April, 2020**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **36.331** | **CR** | **4239** | **rev** | **1** | **Current version:** | **16.0.0** |  |
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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:*** | Miscellaneous Rel-16 eMTC corrections | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Qualcomm Incorporated | | | | | | | | | |
| ***Source to TSG:*** | R2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | LTE\_eMTC5-Core, NB\_IOTenh3-Core | | | | |  | ***Date:*** | | | 2020-04-09 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-16 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) Rel-12 (Release 12)* *Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)* | |
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| ***Reason for change:*** | | Miscellanous correction for Rel-16 eMTC enhancements to RRC specification. | | | | | | | | |
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| ***Summary of change:*** | | * TBD * Addresses following RILs from eMTC ASN.1 review (see R2-2003931): [H092], [H100], [H157], [H103], [N002], [H113], [Z605], [H159], [Z602], [Q501], [H083], [H085], [H090], [Q603], [N009] , [H104], * Addresses following RILs from NB-IoT ASN.1 review (see R2-2003807): [N001], [H098], [H105], [H106], [H107], [H108], [H109], [H110], [H122], [H125] * Addesses following RILs from general ASN.1 review session (see R2-2003801): [H115], [N011], [H162], [H163], [N016], [H116], [H099], [H111], [H112] * Changes from R2-2003138 (RSS) are included, updates based on new agreements. | | | | | | | | |
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| ***Consequences if not approved:*** | | Rel-16 eMTC enhancements will be incomplete from RRC specifications. | | | | | | | | |
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| ***Clauses affected:*** | | TBD | | | | | | | | |
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|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **X** |  | Other core specifications | | | | TS 36.300 CR xx  TS 36.302 CR xx  TS 36.304 CR xx  TS 36.306 CR xx  TS 36.321 CR xx  TS 36.331 CR xx | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | R2-2002849: initial version submitted to RAN2#109bis-e  R2-2003923: this version (endorsed after RAN2#109bis-e) | | | | | | | | |

First change

#### 5.2.2.3 System information required by the UE

The UE shall:

1> ensure having a valid version, as defined below, of (at least) the following system information, also referred to as the 'required' system information:

2> if in RRC\_IDLE:

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

4> the *MasterInformationBlock-NB/ MasterInformationBlock-TDD-NB* and *SystemInformationBlockType1-NB* as well as *SystemInformationBlockType2-NB* through *SystemInformationBlockType5-NB, SystemInformationBlockType22-NB*;

3> else:

4> the *MasterInformationBlock* and *SystemInformationBlockType1* (or *SystemInformationBlockType1-BR* depending on whether the UE is a BL UE or the UE in CE) as well as *SystemInformationBlockType2* through *SystemInformationBlockType8* and *SystemInformationBlockType24* (depending on support of the concerned RATs), *SystemInformationBlockType17* (depending on support of RAN-assisted WLAN interworking when the UE is connected to EPC), *SystemInformationBlockType25* (depending on support of E-UTRA/5GC), *SystemInformationBlockTypeXX* (only for BL UE or the UE in CE depending on support of resource reservation);

2> if in RRC\_INACTIVE:

3> the *MasterInformationBlock* and *SystemInformationBlockType1* as well as *SystemInformationBlockType2* through *SystemInformationBlockType8* (depending on support of the concerned RATs), *SystemInformationBlockType25*;

2> if in RRC\_CONNECTED; and

2> the UE is not a BL UE; and

2> the UE is not in CE; and

2> the UE is not a NB-IoT UE:

3> the *MasterInformationBlock*, *SystemInformationBlockType1* and *SystemInformationBlockType2* as well as *SystemInformationBlockType8* (depending on support of CDMA2000), *SystemInformationBlockType17* (depending on support of RAN-assisted WLAN interworking when the UE is connected to EPC), *SystemInformationBlockType25* (depending on support of E-UTRA/5GC);

2> if in RRC\_CONNECTED and T311 is running; and

2> the UE is a BL UE or the UE is in CE or the UE is a NB-IoT UE;

3> the *MasterInformationBlock* (or *MasterInformationBlock-NB/ MasterInformationBlock-TDD-NB* in NB-IoT), *SystemInformationBlockType1-BR* (or *SystemInformationBlockType1-NB* in NB-IoT) and *SystemInformationBlockType2* (or *SystemInformationBlockType2-NB* in NB-IoT), and for NB-IoT *SystemInformationBlockType22-NB*;

1> delete any stored system information after 3 hours or 24 hours from the moment it was confirmed to be valid as defined in 5.2.1.3, unless specified otherwise;

1> consider any stored system information except *SystemInformationBlockType10,* *SystemInformationBlockType11,* *systemInformationBlockType12* and *systemInformationBlockType14* (*systemInformationBlockType14-NB* in NB-IoT)to be invalid if *systemInfoValueTag* included in the *SystemInformationBlockType1* (*MasterInformationBlock-NB/ MasterInformationBlock-TDD-NB* in NB-IoT) is different from the one of the stored system information and in case of NB-IoT UEs, BL UEs and UEs in CE, *systemInfoValueTagSI* is not broadcasted. Otherwise consider system information validity as defined in 5.2.1.3;

Next change

#### 5.2.2.x Actions upon reception of *SystemInformationBlockTypeXX*

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

Next change

#### 5.3.2.3 Reception of the *Paging* message by the UE

Upon receiving the *Paging* message, the UE shall:

1> if in RRC\_IDLE, for each of the *PagingRecord*, if any, included in the *Paging* message:

2> if the *ue-Identity* included in the *PagingRecord* matches one of the UE identities allocated by upper layers:

3> forward the *ue-Identity, accessType* (if present) and, except for NB-IoT, the *cn-Domain* to the upper layers;

3> store *mt-EDT*, if present;

1> if in RRC\_INACTIVE, for each of the *PagingRecord*, if any, included in the *Paging* message:

2> if the *ue-Identity* included in the *PagingRecord* matches the stored *fullI-RNTI*:

3> if UE is configured with one or more access identities equal to 1, 2 or 11-15 applicable in the selected PLMN:

4> initiate RRC connection resume procedure in 5.3.3.2 with cause value set to 'highProrityAccess';

3> else:

4> initiate the RRC connection resumption procedure according to 5.3.3.2 with cause value set to 'mt-access';

2> else if the *ue-Identity* included in the *PagingRecord* matches one of the UE identities allocated by upper layers:

3> forward the *ue-Identity, accessType* (if present) and the *cn-Domain* to the upper layers;

3> perform the actions upon leaving RRC\_INACTIVE as specified in 5.3.12, with release cause 'other';

1> if the UE is not configured with a DRX cycle longer than the modification period and the *systemInfoModification* is included; or

1> if the UE is configured with a DRX cycle longer than the modification period and the *systemInfoModification-eDRX* is included:

2> re-acquire the required system information using the system information acquisition procedure as specified in 5.2.2.

1> if the *etws-Indication* is included and the UE is ETWS capable:

2> re-acquire *SystemInformationBlockType1* immediately, i.e., without waiting until the next system information modification period boundary;

2> if the *schedulingInfoList* indicates that *SystemInformationBlockType10* is present:

3> acquire *SystemInformationBlockType10*;

NOTE: If the UE is in CE, it is up to UE implementation when to start acquiring *SystemInformationBlockType10*.

2> if the *schedulingInfoList* indicates that *SystemInformationBlockType11* is present:

3> acquire *SystemInformationBlockType11*;

1> if the *cmas-Indication* is included and the UE is CMAS capable:

2> re-acquire *SystemInformationBlockType1* immediately, i.e., without waiting until the next system information modification period boundary as specified in 5.2.1.5;

2> if the *schedulingInfoList* indicates that *SystemInformationBlockType12* is present:

3> acquire *SystemInformationBlockType12*;

1> if in RRC\_IDLE, the *eab-ParamModification* is included and the UE is EAB capable:

2> consider previously stored *SystemInformationBlockType14* as invalid;

2> re-acquire *SystemInformationBlockType1* immediately, i.e., without waiting until the next system information modification period boundary as specified in 5.2.1.6;

2> re-acquire *SystemInformationBlockType14* using the system information acquisition procedure as specified in 5.2.2.4;

1> if in RRC\_IDLE, the *uac-ParamModification* is included and the UE connected to 5GC is a BL UE or UE in CE:

2> consider previously stored *SystemInformationBlockType25* as invalid;

2> re-acquire *SystemInformationBlockType1* immediately, i.e., without waiting until the next system information modification period boundary as specified in 5.2.1.6;

2> re-acquire *SystemInformationBlockType25* using the system information acquisition procedure as specified in 5.2.2.4;

1> if in RRC\_IDLE, the *redistributionIndication* is included and the UE is redistribution capable:

2> perform E-UTRAN inter-frequency redistribution procedure as specified in TS 36.304 [4], clause 5.2.4.10;

Next change

#### 5.3.3.1b Conditions for initiating EDT

A BL UE, UE in CE or NB-IoT UE can initiate EDT 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;

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.

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;

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

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

3> release *tdm-PatternConfig*, if configured;

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 *idc-Config*, if configured;

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

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;

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> 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> 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> 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> 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.

Editor's Note: Where to capture PUR release due to RACH initiation on a new cell.

Next change

#### 5.3.3.3 Actions related to transmission of *RRCConnectionRequest* message

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

1> if the UE is connected to EPC:

2> set the *ue-Identity* as follows:

3> if upper layers provide an S-TMSI:

4> set the *ue-Identity* to the value received from upper layers;

3> else:

4> draw a random value in the range 0 .. 240-1 and set the *ue-Identity* tothis value;

NOTE 1: Upper layers provide the S-TMSI if the UE is registered in the TA of the current cell.

2> if the UE supports *mo-VoiceCall* establishment cause and UE is establishing 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*; or

2> if the UE supports *mo-VoiceCall* establishment cause and EPS fallback for IMS voice (see TS 23.502 [102]) was triggered in NR via *RRCRelease* with *voiceFallbackIndication* (see TS 38.331 [82]) and *SystemInformationBlockType2* includes *voiceServiceCauseIndication* and the establishment cause received from upper layers is not set to *highPriorityAccess*:

3> set the *establishmentCause* to *mo-VoiceCall*;

2> else if the UE supports *mo-VoiceCall* establishment cause for mobile originating MMTEL video and UE is establishing 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*:

3> set the *establishmentCause* to *mo-VoiceCall*;

2> else:

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

1> if the UE is connected to 5GC:

2> set the *ue-Identity* as follows:

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

4> except for NB-IoT, set the ue-Identity to ng-5G-S-TMSI-Part1;

4> for NB-IoT, set the *ue-Identity* to ng-5G-S-TMSI;

3> else:

4> draw a random value in the range 0 .. 240-1 and set the *ue-Identity* to this value;

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

2> except for NB-IoT, apply the default NR PDCP configuration as specified in TS 38.331 [82], clause 9.2.1.1 for SRB1;

2> except for NB-IoT, use NR PDCP for all subsequent messages received and sent by the UE via SRB1;

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

2> if the UE is connected to EPC:

3> if the UE supports multi-tone transmission, include *multiToneSupport*;

3> if the UE supports multi-carrier operation, include *multiCarrierSupport*;

3> set *earlyContentionResolution* to TRUE;

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 as specified in TS 36.133 [16];

NOTE 2: The downlink channel quality measurements use measurement period T1 or T2, as defined in TS 36.133 [16].

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

The UE shall continue cell re-selection related measurements as well as cell re-selection evaluation. If the conditions for cell re-selection are fulfilled, the UE shall perform cell re-selection as specified in 5.3.3.5.

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

1> else:

2> 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 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 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> 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), 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 measurement s results 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:

3> apply the physical channel configuration in accordance with the stored *pur-Config*;

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 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> apply the physical channel configuration in accordance with the stored *pur-Config*;

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

Next change

#### 5.3.3.4 Reception of the *RRCConnectionSetup* by the UE

NOTE 1: Prior to this, lower layer signalling is used to allocate a C-RNTI. For further details see TS 36.321 [6];

The UE shall:

1> except for BL UE or UE in CE connected to 5GC, if the *RRCConnectionSetup* is received in response to an *RRCConnectionResumeRequest* from a suspended RRC connection:

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

3> discard any current AS security context including the KRRCenc key, the KRRCint key, the KUPint key and the KUPenc key;

2> release all radio resources, including release of the RLC entity, the MAC configuration and the associated PDCP entity for all established or suspended RBs, except for SRB0;

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

2> if stored, discard the stored *nextHopChainingCount*;

2> if stored, discard the stored *drb-ContinueROHC*;

2> indicate to upper layers fallback of the RRC connection;

1> if the *RRCConnectionSetup* is received in response to an *RRCConnectionResumeRequest* from RRC\_INACTIVE:

2> stop T380 if running;

2> discard the stored UE Inactive AS context;

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

1> for BL UE or UE in CE connected to 5GC, if the *RRCConnectionSetup* is received in response to an *RRCConnectionResumeRequest* from a suspended RRC connection:

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

2> if stored, discard the stored *nextHopChainingCount*;

2> if stored, discard the stored *drb-ContinueROHC*;

1> if the *RRCConnectionSetup* is received in response to an *RRCConnectionResumeRequest* from RRC\_INACTIVE; or

1> for BL UE or UE in CE connected to 5GC, if the *RRCConnectionSetup* is received in response to an *RRCConnectionResumeRequest* from a suspended RRC connection:

2> discard any current AS security context including the KRRCenc key, the KRRCint key, the KUPint key and the KUPenc key;

2> release radio resources for all established RBs except SRB0, including release of the RLC entities, of the associated PDCP entities and of SDAP entities;

2> release the RRC configuration except for the default L1 parameter values, default MAC main configuration and CCCH;

2> apply the default NR PDCP configuration as specified in TS 38.331 [82], clause 9.2.1.1 for SRB1;

2> use NR PDCP for all subsequent messages received and sent by the UE via SRB1;

2> indicate to upper layers fallback of the RRC connection;

1> if the *RRCConnectionSetup* is received in response to an *RRCConnectionResumeRequest* or *RRCEarlyDataRequest* for transmission using PUR:

2> if *newUE-Identity* is included:

3> apply the value of the *newUE-Identity* as the C-RNTI;

2> else:

3> apply the value of the *pur-RNTI* as the C-RNTI;

1> perform the radio resource configuration procedure in accordance with the received *radioResourceConfigDedicated* and as specified in 5.3.10;

1> if stored, discard the cell reselection priority information provided by the *idleModeMobilityControlInfo* or inherited from another RAT;

1> if stored, discard the dedicated offset provided by the *redirectedCarrierOffsetDedicated*;

1> stop timer T300;

1> if T302 is running:

2> stop timer T302;

2> if the UE is connected to 5GC:

3> perform the actions as specified in 5.3.16.4;

1> stop timer T303, if running;

1> stop timer T305, if running;

1> stop timer T306, if running;

1> stop timer T308, if running;

1> perform the actions as specified in 5.3.3.7;

1> stop timer T320, if running;

1> stop timer T350, if running;

1> perform the actions as specified in 5.6.12.4;

1> release *rclwi-Configuration*, if configured, as specified in 5.6.16.2;

1> stop timer T360, if running;

1> stop timer T322, if running;

1> stop timer T331, if running;

1> forward the *dedicatedInfoNAS,* if received, to the upper layers;

1> if T309 is running:

2> stop timer T309 for all access categories;

2> perform the actions as specified in 5.3.16.4.

1> enter RRC\_CONNECTED;

1> stop the cell re-selection procedure;

1> consider the current cell to be the PCell;

1> set the content of *RRCConnectionSetup**Complete* message as follows:

2> if the *RRCConnectionSetup* is received in response to an *RRCConnectionResumeRequest*:

3> if upper layers provide an S-TMSI:

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

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

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

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

4> else:

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

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

3> except for NB-IoT, set the *ng-5G-S-TMSI-Bits* to *ng-5G-S-TMSI-Part2* to the leftmost 8 bits of 5G-S-TMSI received from upper layers;

2> set the *selectedPLMN-Identity* to the PLMN selected by upper layers (see TS 23.122 [11], TS 24.301 [35] for E-UTRA/EPC and TS 24.501 [95] for E-UTRA/5GC) from the PLMN(s) included in the *plmn-IdentityList* in *SystemInformationBlockType1* (or *SystemInformationBlockType1-NB* in NB-IoT);

2> if upper layers provide the 'Registered MME', include and set the *registeredMME* as follows:

3> if the PLMN identity of the 'Registered MME' is different from the PLMN selected by the upper layers:

4> include the *plmnIdentity* in the *registeredMME* and set it to the value of the PLMN identity in the 'Registered MME' received from upper layers;

3> set the *mmegi* andthe *mmec* to the value received from upper layers;

2> if upper layers provided the 'Registered MME':

3> include and set the *gummei-Type* to the value provided by the upper layers;

2> if upper layers provide the 'Registered AMF', include and set the *registeredAMF* as follows:

3> if the PLMN identity of the 'Registered AMF' is different from the PLMN selected by the upper layers:

4> include the *plmnIdentity* in the *registeredAMF* and set it to the value of the PLMN identity in the 'Registered AMF' received from upper layers;

3> set the *amf-Identifier* to AMF Identifier of the 'Registered AMF' received from upper layers;

2> if upper layers provided the 'Registered AMF':

3> include and set the *guami-Type* to the value provided by the upper layers;

2> if upper layers provide one or more S-NSSAI (see TS 23.003 [27]):

3> include the *s-NSSAI-list* and set the content to the values provided by the upper layers;

2> if the UE supports CIoT EPS optimisation(s):

3> include a*ttachWithoutPDN-Connectivity* if received from upper layers;

3> include *up-CIoT-EPS-Optimisation* if received from upper layers;

3> except for NB-IoT, include *cp-CIoT-EPS-Optimisation* if received from upper layers;

2> if the UE supports CIoT 5GS optimisation(s):

3> for NB-IoT, include *ng-U-DataTransfer* if received from upper layers;

3> except for NB-IoT, include *cp-CIoT-5GS-Optimisatoin* if received from upper layers;

2> if connecting as an RN:

3> include the *rn-SubframeConfigReq*;

2> if the *RRCConnectionSetup* is received in response to *RRCEarlyDataRequest*:

3> set the *dedicatedInfoNAS* to a zero-length octet string;

2> else:

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

2> if the UE is connected to EPC:

3> except for NB-IoT:

4> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report*:

5> include *rlf-InfoAvailable*;

4> if the UE has MBSFN logged measurements available for E-UTRA and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:

5> include *logMeasAvailableMBSFN*;

4> else if the UE has logged measurements available for E-UTRA and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:

5> include *logMeasAvailable*;

4> if the UE has Bluetooth logged measurements available and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:

5> include *logMeasAvailableBT*;

4> if the UE has WLAN logged measurements available and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:

5> include *logMeasAvailableWLAN*;

4> if the UE has connection establishment failure information available in *VarConnEstFailReport* and if the RPLMN is equal to *plmn-Identity* stored in *VarConnEstFailReport*:

5> include *connEstFailInfoAvailable*;

4> include the *mobilityState* and set it to the mobility state (as specified in TS 36.304 [4]) of the UE just prior to entering RRC\_CONNECTED state;

4> if the UE has flight path information available:

5> include *flightPathInfoAvailable*;

3> for NB-IoT:

4> if the UE has radio link failure information available in *VarRLF-Report-NB* and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report*:

5> include *rlf-InfoAvailable*;

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

5> include *anr-InfoAvailable*;

3> include *dcn-ID* if a DCN-ID value (see TS 23.401 [41]) is received from upper layers;

2> else (i.e. the UE is connected to 5GC):

3> if the UE is a BL UE:

4> include *lte-M*;

2> except for NB-IoT:

3> if the UE supports storage of mobility history information and the UE has mobility history information available in *VarMobilityHistoryReport*:

4> include the *mobilityHistoryAvail*;

3> if the SIB2 contains *idleModeMeasurements*, and the UE has idle/inactive measurement information concerning cells other than the PCell available in *VarMeasIdleReport*:

4> include the *idleMeasAvailable*;

3> if upper layers indicate that access to RLOS is initiated (see TS 23.401 [41] subclause 4.3.8.3):

4> set *rlos-Request* to *true*;

2> if UE needs UL gaps during continuous uplink transmission:

3> include *ue-CE-NeedULGaps*;

2> for NB-IoT:

3> if the UE supports serving cell idle mode measurements reporting and *servingCellMeasInfo* is present in *SystemInformationBlockType2-NB*:

4> set the *measResultServCell* to include the measurements of the serving cell;

NOTE 2: The UE includes the latest results of the serving cell measurements as used for cell selection/ reselection evaluation, which are performed in accordance with the performance requirements as specified in TS 36.133 [16].

2> if connecting as an IAB-node:

3> include *iab-NodeIndication;*

1> submit the *RRCConnectionSetupComplete* message to lower layers for transmission;

1> the procedure ends.

#### 5.3.3.4a Reception of the *RRCConnectionResume* by the UE

The UE shall:

1> stop timer T300;

1> if T309 is running:

2> stop timer T309 for all access categories;

2> perform the actions as specified in 5.3.16.4.

1> stop T380 if running;

1> if the *RRCConnectionResume* is received in response to an *RRCConnectionResumeRequest* for EDT or for transmission using PUR:

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

1> else:

2> if resuming an RRC connection from a suspended RRC connection in EPC; or

2> for NB-IoT, if resuming an RRC connection from a suspended RRC connection in 5GC and *fullConfig* is not present in the *RRCConnectionResume* message:

3> if the *RRCConnectionResume* message does not include the *restoreMCG-SCells*:

4> release the MCG SCell(s) from the UE AS context, if stored;

3> if the *RRCConnectionResume* message does not include the *restoreSCG*:

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

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

3> restore the PDCP state and re-establish PDCP entities for SRB2, if configured withE-UTRA PDCP, and for all DRBs that are configured with E-UTRA PDCP;

3> if *drb-ContinueROHC* is included:

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> discard the stored UE AS context and *resumeIdentity*;

3> configure lower layers to consider the restored MCG and SCG SCell(s) (if any) to be in deactivated state;

2> else if the *RRCConnectionResume* message includes the *fullConfig* (i.e., for resuming an RRC connection from RRC\_INACTIVE or for resuming a suspended RRC connection in 5GC):

3> perform the radio configuration procedure as specified in 5.3.5.8;

2> else if resuming an RRC connection from RRC\_INACTIVE:

3> if the *RRCConnectionResume* message does not include the *restoreMCG-SCells*:

4> release the MCG SCell(s) from the UE Inactive AS context, if stored;

3> if the *RRCConnectionResume* message does not include the *restoreSCG*:

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

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

3> restore the following from the stored UE Inactive AS context:

- MCG physical layer configuration,

- MCG MAC configuration,

- MCG RLC configuration,

- PDCP configuration,

- MCG SCell configurations, if stored

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

3> discard the stored UE Inactive AS context;

3> configure lower layers to consider the restored MCG and SCG SCell(s) (if any) to be in deactivated state;

3> release the *rrc-InactiveConfig*, except *ran-NotificationAreaInfo*;

2> else (i.e., except for NB-IoT for resuming a suspended RRC connection in 5GC):

3> restore the physical layer configuration, the MAC configuration, the RLC configuration and the PDCP configuration from the stored UE AS context;

3> discard the stored UE AS context and *resumeIdentity*;

1> perform the radio resource configuration procedure in accordance with the received *radioResourceConfigDedicated* and as specified in 5.3.10;

NOTE 1: When performing the radio resource configuration procedure, for the physical layer configuration and the MAC Main configuration, the restored RRC configuration from the stored UE AS context is used as basis for the reconfiguration.

1> if the received *RRCConnectionResume* includes the *sCellToReleaseList*:

2> perform SCell release as specified in 5.3.10.3a;

1> if the received *RRCConnectionResume* includes the *sCellToAddModList*:

2> perform SCell addition or modification as specified in 5.3.10.3b;

1> if the received *RRCConnectionResume* includes the *sCellGroupToReleaseList*:

2> perform SCell group release as specified in 5.3.10.3d;

1> if the received *RRCConnectionResume* includes the *sCellGroupToAddModList*:

2> perform SCell group addition or modification as specified in 5.3.10.3e;

1> if the received *RRCConnectionResume* message includes the *nr-SecondaryCellGroupConfig*:

2> perform NR RRC Reconfiguration as specified in TS 38.331 [82], clause 5.3.5.3;

1> if the received *RRCConnectionResume* message includes the *sk-Counter*:

2> perform key update procedure as specified in TS 38.331 [82], clause 5.3.5.8;

1> if the received *RRCConnectionResume* message includes the *nr-RadioBearerConfig1*:

2> perform radio bearer configuration as specified in TS 38.331 [82], clause 5.3.5.6;

1> if the received *RRCConnectionResume* message includes the *nr-RadioBearerConfig2*:

2> perform radio bearer configuration as specified in TS 38.331 [82], clause 5.3.5.6;

1> except if the *RRCConnectionResume* is received in response to an *RRCConnectionResumeRequest* for EDT or for transmission using PUR:

2> resume SRB2 and all DRBs, if any, including RBs configured with NR PDCP;

1> if stored, discard the cell reselection priority information provided by the *idleModeMobilityControlInfo* or inherited from another RAT;

1> if stored, discard the dedicated offset provided by the *redirectedCarrierOffsetDedicated*;

1> if the *RRCConnectionResume* message includes the *measConfig*:

2> perform the measurement configuration procedure as specified in 5.5.2;

1> if T302 is running:

2> stop timer T302;

2> if the UE is connected to 5GC:

3> perform the actions as specified in 5.3.16.4;

1> stop timer T303, if running;

1> stop timer T305, if running;

1> stop timer T306, if running;

1> stop timer T308, if running;

1> perform the actions as specified in 5.3.3.7;

1> stop timer T320, if running;

1> stop timer T350, if running;

1> perform the actions as specified in 5.6.12.4;

1> stop timer T360, if running;

1> stop timer T322, if running;

1> if timer T331 is running:

2> stop timer T331;

2> perform the actions as specified in 5.6.20.3;

1> if the UE is resuming an RRC connection after early security reactivation in accordance with conditions in 5.3.3.18 or *RRCConnectionResume* is received in response to an *RRCConnectionResumeRequest* from RRC\_INACTIVE:

2> ignore the *nextHopChainingCount* value indicated in the *RRCConnectionResume* message;

2> if the *RRCConnectionResume* is received in response to an *RRCConnectionResumeRequest* for transmission using PUR:

3> if *newUE-Identity* is included:

4> apply the value of the *newUE-Identity* as the C-RNTI;

3> else:

4> apply the value of the *pur-RNTI* as the C-RNTI;

1> else:

2> if resuming an RRC connection from a suspended RRC connection in EPC:

3> update the KeNB key based on the KASME key to which the current KeNB is associated, using the *nextHopChainingCount* value indicated in the *RRCConnectionResume* message, as specified in TS 33.401 [32];

3> store the *nextHopChainingCount* value;

3> derive the KRRCint key associated with the previously configured integrity algorithm, as specified in TS 33.401 [32];

3> request lower layers to verify the integrity protection of the *RRCConnectionResume* message, using the previously configured algorithm and the KRRCint key;

3> if the integrity protection check of the *RRCConnectionResume* message fails:

4> perform the actions upon leaving RRC\_CONNECTED as specified in 5.3.12, with release cause 'other', upon which the procedure ends;

3> derive the KRRCenc key and the KUPenc key associated with the previously configured ciphering algorithm, as specified in TS 33.401 [32];

3> configure lower layers to resume integrity protection using the previously configured algorithm and the KRRCint key immediately, i.e., integrity protection shall be applied to all subsequent messages received and sent by the UE;

3> configure lower layers to resume ciphering and to apply the ciphering algorithm, the KRRCenc key and the KUPenc key, i.e. the ciphering configuration shall be applied to all subsequent messages received and sent by the UE;

1> enter RRC\_CONNECTED;

1> indicate to upper layers that the suspended RRC connection has been resumed;

1> stop the cell re-selection procedure;

1> consider the current cell to be the PCell;

1> set the content of *RRCConnectionResumeComplete* message as follows:

2> set the *selectedPLMN-Identity* to the PLMN selected by upper layers (see TS 23.122 [11], TS 24.301 [35] for E-UTRA/EPC and TS 24.501 [95] for E-UTRA/5GC) from the PLMN(s) included in the *plmn-IdentityList* in *SystemInformationBlockType1*;

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

2> except for NB-IoT:

3> if resuming an RRC connection from a suspended RRC connection:

4> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report*:

5> include rlf-InfoAvailable;

4> if the UE has MBSFN logged measurements available for E-UTRA and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:

5> include logMeasAvailableMBSFN;

4> else if the UE has logged measurements available for E-UTRA and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:

5> include logMeasAvailable;

4> if the UE has Bluetooth logged measurements available and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:

5> include logMeasAvailableBT;

4> if the UE has WLAN logged measurements available and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:

5> include logMeasAvailableWLAN;

4> if the UE has connection establishment failure information available in *VarConnEstFailReport* and if the RPLMN is equal to *plmn-Identity* stored in *VarConnEstFailReport*:

5> include connEstFailInfoAvailable;

4> include the *mobilityState* and set it to the mobility state (as specified in TS 36.304 [4]) of the UE just prior to entering RRC\_CONNECTED state;

4> if the UE has flight path information available:

5> include *flightPathInfoAvailable*;

3> if the UE supports storage of mobility history information and the UE has mobility history information available in *VarMobilityHistoryReport*:

4> include *mobilityHistoryAvail*;

3> if the *idleModeMeasurementReq* is included in the *RRCConnectionResume* message:

4> if the UE has idle/inactive measurement information concerning cells other than the PCell available in *VarMeasIdleReport*:

Editor's note: FFS if the *idleModeMeasurementReq* indicates all results (EUTRA and NR), or can request only EUTRA or NR results. The procedure below assumes the former.

5> set the *measResultListIdle* in the *RRCConnectionResumeComplete* message to the value of *measReportIdle* in the *VarMeasIdleReport,* if available;

5> set the *measResultListIdleNR* in the *RRCConnectionResumeComplete* message to the value of *measReportIdleNR* in the *VarMeasIdleReport*, if available;

5> discard the *VarMeasIdleReport* upon successful delivery of the *RRCConnectionResumeComplete* message is confirmed by lower layers;

3> if the SIB2 contains *idleModeMeasurements*, and the UE has idle/inactive measurement information concerning cells other than the PCell available in *VarMeasIdleReport*:

4> include the *idleMeasAvailable*;

3> if the *RRCConnectionResume* message includes *nr-SecondaryCellGroupConfig*:

4> include *scg-ConfigResponseNR* in accordance with TS 38.331 [82], clause 5.3.5.3;

2> for NB-IoT:

3> if the UE supports serving cell idle mode measurements reporting and *servingCellMeasInfo* is present in *SystemInformationBlockType2-NB*:

4> set the *measResultServCell* to include the measurements of the serving cell;

NOTE 2: The UE includes the latest results of the serving cell measurements as used for cell selection/ reselection evaluation, which are performed in accordance with the performance requirements as specified in TS 36.133 [16].

3> if the UE is connected to EPC:

4> if the UE has radio link failure information available in *VarRLF-Report-NB* and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report-NB*:

5> include *rlf-InfoAvailable*;

4> 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*:

5> include *anr-InfoAvailable*;

1> submit the *RRCConnectionResumeComplete* message to lower layers for transmission;

1> the procedure ends.

Next change

#### 5.3.7.2 Initiation

The UE shall only initiate the procedure either when AS security has been activated or for a NB-IoT UE supporting RRC connection re-establishment for the Control Plane CIoT EPS optimisation. The UE initiates the procedure when one of the following conditions is met:

1> upon detecting radio link failure and T316 is not configured, in accordance with 5.3.11; or

1> upon handover failure, in accordance with 5.3.5.6; or

1> upon mobility from E-UTRA failure, in accordance with 5.4.3.5; or

1> except when resuming an RRC connection after early security reactivation in accordance with conditions in 5.3.3.18, upon integrity check failure indication from lower layers concerning SRB1 or SRB2; or

1> upon an RRC connection reconfiguration failure, in accordance with 5.3.5.5; or

1> upon an RRC connection reconfiguration failure, in accordance with TS38.331 [82], clause 5.3.5.8; or

1> upon detecting radio link failure for the SCG while MCG transmission is suspended, in accordance with TS 38.331 [82] subclause 5.3.10.3 in (NG)EN-DC; or

1> upon SCG change failure while MCG transmission is suspended, in accordance with TS 38.331 [82] subclause 5.3.5.8.3 in (NG)EN-DC; or

1> upon SCG configuration failure while MCG transmission is suspended in accordance with subclause TS 38.331 [82] subclause 5.3.5.8.2 in (NG)EN-DC; or

1> upon integrity check failure indication from SCG lower layers concerning SRB3 while MCG transmission is suspended; or

1> upon T316 expiry, in accordance with sub-clause 5.6.26.5.

NOTE: When resuming an RRC connection after early security reactivation in accordance with conditions in 5.3.3.18, integrity check failure indication from lower layers is handled in accordance with clause 5.3.3.16.

Upon initiation of the procedure, the UE shall:

1> stop timer T310, if running;

1> stop timer T312, if running;

1> stop timer T313, if running;

1> stop timer T316, if running;

1> stop timer T307, if running;

1> start timer T311;

1> stop timer T370, if running;

1> release *uplinkDataCompression*, if configured;

1> suspend all RBs, including RBs configured with NR PDCP, except SRB0;

1> reset MAC;

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

1> release the SCell group(s), if configured, in accordance with 5.3.10.3d;

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

1> except for NB-IoT, for the MCG, apply the default semi-persistent scheduling configuration as specified in 9.2.3;

1> for NB-IoT, release *schedulingRequestConfig*, if configured;

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

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

1> release *reportProximityConfig*, if configured and clear any associated proximity status reporting timer;

1> release *obtainLocationConfig*, if configured;

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

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

1> release *measSubframePatternPCell*, if configured;

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

1> if (NG)EN-DC is configured:

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

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

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

2> release *tdm-PatternConfig*, if configured;

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

1> if connected as an RN and configured with an RN subframe configuration:

2> release the RN subframe configuration;

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

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

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

1> perform cell selection in accordance with the cell selection process as specified in TS 36.304 [4];

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

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

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

Editor's Note: Where to capture PUR release due to RACH initiation on a new cell.

Next change

### 5.3.12 UE actions upon leaving RRC\_CONNECTED or RRC\_INACTIVE

Upon leaving RRC\_CONNECTED or RRC\_INACTIVE, the UE shall:

1> reset MAC;

1> if leaving RRC\_INACTIVE was not triggered by the reception of *RRCConnectionRelease* including *idleModeMobilityControlInfo*:

2> stop the timer T320, if running;

2> if stored, discard the cell reselection priority information provided by the *idleModeMobilityControlInfo*;

1> if entering RRC\_IDLE was triggered by reception of the *RRCConnectionRelease* message including a *waitTime*:

2> start timer T302, with the timer value set according to the *waitTime*;

2> inform the upper layer that access barring is applicable for all access categories except categories '0' and '2';

1> else if T302 is running:

2> stop timer T302;

2> if the UE is connected to 5GC:

3> perform the actions as specified in 5.3.16.4;

1> if T309 is running:

2> stop timer T309 for all access categories;

2> perform the actions as specified in 5.3.16.4.

1> stop all timers that are running except T302, T320, T322, T325, T330, T331;

1> release *crs-ChEstMPDCCH-ConfigDedicated*, if configured;

1> if leaving RRC\_CONNECTED was triggered by suspension of the RRC:

2> re-establish RLC entities for all SRBs and DRBs, including RBs configured with NR PDCP;

2> store the UE AS Context including the current RRC configuration, the current security context, the PDCP state including ROHC state, C-RNTI used in the source PCell, the *cellIdentity* and the physical cell identity of the source PCell;

2> store the following information provided by E-UTRAN:

3> the *resumeIdentity*;

3> the *nextHopChainingCount*, if present. Otherwise discard any stored *nextHopChainingCount* that does not correspond to stored key KRRCint;

3> the *drb-ContinueROHC*, if present. Otherwise discard any stored *drb-ContinueROHC*;

2> suspend all SRB(s) and DRB(s), including RBs configured with NR PDCP, except SRB0;

2> if the UE connected to 5GC is a BL UE or UE in CE, indicate PDCP suspend to lower layers of all DRBs;

2> if the UE connected to 5GC is moving to RRC\_IDLE:

3> indicate the idle suspension of the RRC connection to upper layers;

2> else:

3> indicate the suspension of the RRC connection to upper layers;

2> configure lower layers to suspend integrity protection and ciphering;

NOTE 1: Except when resuming an RRC connection after early security reactivation in accordance with conditions in 5.3.3.18, ciphering is not applied for the subsequent *RRCConnectionResume* message used to resume the connection and an integrity check is performed by lower layers, but merely upon request from RRC.

1> else:

2> upon leaving RRC\_INACTIVE:

3> discard the UE Inactive AS context;

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

3> discard the KeNB, the KRRCenc key, the KRRCint and the KUPenc key;

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

2> remove all entries within *VarConditionalReconfiguration*, if any;

2> for each *measId*, that is part of the current UE configuration in *VarMeasConfig,* if the associated *reportConfig* has *condReconfigurationTriggerEUTRA* configured:

3> remove the entry with the matching *reportConfigId* from the *reportConfigList* within the *VarMeasConfig*;

3> if the associated *measObjectId* is only associated with *condReconfigurationTriggerEUTRA*:

4> remove the entry with the matching *measObjectId* from the *measObjectList* within the *VarMeasConfig*;

3> remove the entry with the matching *measId* from the *measIdList* within the *VarMeasConfig*;

2> release all radio resources, including release of the MAC configuration, the RLC entity and the associated PDCP entity and SDAP (if any) for all established RBs;

2> indicate the release of the RRC connection to upper layers together with the release cause;

1> if leaving RRC\_CONNECTED was triggered neither by reception of the *MobilityFromEUTRACommand* message nor by selecting an inter-RAT cell while T311 was running; or

1> if leaving RRC\_INACTIVE was not triggered by the inter-RAT cell reselection:

2> if timer T350 is configured:

3> start timer T350;

3> apply *rclwi-Configuration* if configured, otherwise apply the *wlan-Id-List* corresponding to the RPLMN included in *SystemInformationBlockType17*;

2> else:

3> release the *wlan-OffloadConfigDedicated*, if received;

3> if the *wlan-OffloadConfigCommon* corresponding to the RPLMN is broadcast by the cell:

4> apply the *wlan-OffloadConfigCommon* corresponding to the RPLMN included in *SystemInformationBlockType17*;

4> apply *steerToWLAN* if configured, otherwise apply the *wlan-Id-List* corresponding to the RPLMN included in *SystemInformationBlockType17*;

2> enter RRC\_IDLE and perform procedures as specified in TS 36.304 [4], clause 5.2.7;

1> else:

2> release the *wlan-OffloadConfigDedicated*, if received;

NOTE 2: BL UEs or UEs in CE verifies validity of SI when released to RRC\_IDLE.

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

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

Next change

#### 5.3.16.1 General

The purpose of this procedure is to perform access barring check for an access attempt associated with a given Access Category and one or more Access Identities upon request from upper layers according to TS 24.501 [95] or the RRC layer.

BL UE or UE in CE in RRC\_CONNECTED uses *SystemInformationBlockType25,* if broadcasted,acquired when entering RRC\_CONNECTED.

Except for BL UE and UE in CE, after a handover resulting in change of PCell in RRC\_CONNECTED the UE shall defer access barring checks until it has obtained valid UAC information (from *SystemInformationBlockType25*) from the target cell if the *SystemInformationBlockType25* is broadcasted. For BL UE or UE in CE after a handover resulting in change of PCell, the UE shall consider sy*stemInformationBlockType25* is not broadcast in the target cell until the UE leaves RRC\_CONNECTED.

In NB-IoT, in RRC\_CONNECTED, the UE uses *MasterInformationBlock-NB* */ MasterInformationBlock-TDD-NB* and *SystemInformationBlockType14-NB,* if broadcasted,acquired when entering RRC\_CONNECTED.

Next change

#### 5.6.2.3 Actions related to transmission of *ULInformationTransfer* message

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

1> if there is a need to transfer NAS information:

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

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

2> else, set the *dedicatedInfoType* to include the *dedicatedInfoNAS*;

1> if there is a need to transfer CDMA2000 1XRTT information:

2> set the *dedicatedInfoType* to include the *dedicatedInfoCDMA2000-1XRTT*;

1> if there is a need to transfer CDMA2000 HRPD information:

2> set the *dedicatedInfoType* to include the *dedicatedInfoCDMA2000-HRPD*;

1> upon RRC connection establishment, if UE supports the Control Plane CIoT EPS/5GS optimisation and UE does not need UL gaps during continuous uplink transmission:

2> configure lower layers to stop using UL gaps during continuous uplink transmission in FDD for *ULInformationTransfer* message and subsequent uplink transmission in RRC\_CONNECTED except for UL transmissions as specified in TS 36.211 [21];

1> if there is a need to transfer F1AP information (applies only to IAB-MT):

2> include the *dedicatedInfoF1AP*;

1> submit the *ULInformationTransfer* message to lower layers for transmission, upon which the procedure ends;

Next change

### 6.2.2 Message definitions

<<unchanged text skipped>>

#### *– PURConfigurationRequest*

The *PURConfigurationRequest* message is used by BL UE or UE in CE to indicate to the E-UTRAN that the UE is interested to be configured with PUR and provide PUR related information to E-UTRAN.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E‑UTRAN

*PURConfigurationRequest message*

-- ASN1START

PURConfigurationRequest-r16 ::= SEQUENCE {

criticalExtensions CHOICE {

purConfigurationRequest PURConfigurationRequest-r16-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

PURConfigurationRequest-r16-IEs ::= SEQUENCE {

pur-ConfigRequest-r16 CHOICE {

pur-ReleaseRequest NULL,

pur-SetupRequest SEQUENCE {

requestedNumOccasions-r16 ENUMERATED {one, infinite},

requestedPeriodicity-r16 ENUMERATED {n8, n16, n32, n64, n128, n256, n512,

n1024, n2048, n4096, n8192, spare5},

requestedTBS-r16 ENUMERATED {b328, b408, b504, b600, b712, b808,

b936, b1000, b1352, b1544, b1736, b1992,

b2152, b2344, b2792, b2984},

rrc-ACK-r16 ENUMERATED {true} OPTIONAL,

requestedTimeOffset-r16 TypeFFS OPTIONAL

}

} OPTIONAL,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

| *PURConfigurationRequest* field descriptions |
| --- |
|  |
| ***requestedNumOccasions***  Indicates the requested number of PUR grant occasions. Value *one* corresponds to one occasion and value *infinite* corresponds to infinite occasions. |
| ***requestedPeriodicity***  Indicates the requested periodicity for the PUR expressed as multiple of 10.24s. Value n8 indicates 8, value n16 inidcates 16 and so on. Actual value = indicated value \* 10.24s. |
| ***requestedTBS***  Indicates the requested TBS for the PUR. b328 corresponds to 328 bits, b408 corresponds to 408 bits and so on. The maximum requested TBS is limited to the UL TBS size supported by the UE. |
| ***requestedTimeOffset***  Indicates the requested time offset for the first PUR occasion, i.e. the requested time gap from transmission of PUR request until the first PUR occasion.  Editor's Note: Exact wording and type FFS. |
| ***rrc-ACK***  Indicates RRC response message is preferred by the UE for acknowledging the reception of a transmission using PUR. |

<<unchanged text skipped>>

#### – *RRCConnectionRelease*

The *RRCConnectionRelease* message is used to command the release of an RRC connection, or to complete an UP-EDT procedure.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: E‑UTRAN to UE

*RRCConnectionRelease message*

-- ASN1START

RRCConnectionRelease ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

c1 CHOICE {

rrcConnectionRelease-r8 RRCConnectionRelease-r8-IEs,

spare3 NULL, spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

RRCConnectionRelease-r8-IEs ::= SEQUENCE {

releaseCause ReleaseCause,

redirectedCarrierInfo RedirectedCarrierInfo OPTIONAL, -- Need ON

idleModeMobilityControlInfo IdleModeMobilityControlInfo OPTIONAL, -- Need OP

nonCriticalExtension RRCConnectionRelease-v890-IEs OPTIONAL

}

RRCConnectionRelease-v890-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING (CONTAINING RRCConnectionRelease-v9e0-IEs) OPTIONAL,

nonCriticalExtension RRCConnectionRelease-v920-IEs OPTIONAL

}

-- Late non critical extensions

RRCConnectionRelease-v9e0-IEs ::= SEQUENCE {

redirectedCarrierInfo-v9e0 RedirectedCarrierInfo-v9e0 OPTIONAL, -- Cond NoRedirect-r8

idleModeMobilityControlInfo-v9e0 IdleModeMobilityControlInfo-v9e0 OPTIONAL, -- Cond IdleInfoEUTRA

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- Regular non critical extensions

RRCConnectionRelease-v920-IEs ::= SEQUENCE {

cellInfoList-r9 CHOICE {

geran-r9 CellInfoListGERAN-r9,

utra-FDD-r9 CellInfoListUTRA-FDD-r9,

utra-TDD-r9 CellInfoListUTRA-TDD-r9,

...,

utra-TDD-r10 CellInfoListUTRA-TDD-r10

} OPTIONAL, -- Cond Redirection

nonCriticalExtension RRCConnectionRelease-v1020-IEs OPTIONAL

}

RRCConnectionRelease-v1020-IEs ::= SEQUENCE {

extendedWaitTime-r10 INTEGER (1..1800) OPTIONAL, -- Need ON

nonCriticalExtension RRCConnectionRelease-v1320-IEs OPTIONAL

}

RRCConnectionRelease-v1320-IEs::= SEQUENCE {

resumeIdentity-r13 ResumeIdentity-r13 OPTIONAL, -- Need OR

nonCriticalExtension RRCConnectionRelease-v1530-IEs OPTIONAL

}

RRCConnectionRelease-v1530-IEs ::= SEQUENCE {

drb-ContinueROHC-r15 ENUMERATED {true} OPTIONAL, -- Cond UP-EDT

nextHopChainingCount-r15 NextHopChainingCount OPTIONAL, -- Cond EarlySec

measIdleConfig-r15 MeasIdleConfigDedicated-r15 OPTIONAL, -- Need ON

rrc-InactiveConfig-r15 RRC-InactiveConfig-r15 OPTIONAL, -- Need OR

cn-Type-r15 ENUMERATED {epc,fivegc} OPTIONAL, -- Need OR

nonCriticalExtension RRCConnectionRelease-v1540-IEs OPTIONAL

}

RRCConnectionRelease-v1540-IEs ::= SEQUENCE {

waitTime INTEGER (1..16) OPTIONAL, -- Cond 5GC

nonCriticalExtension RRCConnectionRelease-v16xy-IEs OPTIONAL

}

RRCConnectionRelease-v16xy-IEs ::= SEQUENCE {

resumeIdentity-r16 I-RNTI-r15 OPTIONAL, -- Need OR

pur-Config-r16 SetupRelease {PUR-Config-r16} OPTIONAL, -- Need ON

rrc-InactiveConfig-v16xy RRC-InactiveConfig-v16xy OPTIONAL, -- Cond BLCE-IDLEeDRX

releaseIdleMeasConfig ENUMERATED {true} OPTIONAL, -- Need ON

nonCriticalExtension SEQUENCE {} OPTIONAL

}

ReleaseCause ::= ENUMERATED {loadBalancingTAUrequired,

other, cs-FallbackHighPriority-v1020, rrc-Suspend-v1320}

RedirectedCarrierInfo ::= CHOICE {

eutra ARFCN-ValueEUTRA,

geran CarrierFreqsGERAN,

utra-FDD ARFCN-ValueUTRA,

utra-TDD ARFCN-ValueUTRA,

cdma2000-HRPD CarrierFreqCDMA2000,

cdma2000-1xRTT CarrierFreqCDMA2000,

...,

utra-TDD-r10 CarrierFreqListUTRA-TDD-r10,

nr-r15 CarrierInfoNR-r15

}

RedirectedCarrierInfo-v9e0 ::= SEQUENCE {

eutra-v9e0 ARFCN-ValueEUTRA-v9e0

}

RRC-InactiveConfig-r15::= SEQUENCE {

fullI-RNTI-r15 I-RNTI-r15,

shortI-RNTI-r15 ShortI-RNTI-r15,

ran-PagingCycle-r15 ENUMERATED { rf32, rf64, rf128, rf256} OPTIONAL, --Need OR

ran-NotificationAreaInfo-r15 RAN-NotificationAreaInfo-r15 OPTIONAL, --Need ON

periodic-RNAU-timer-r15 ENUMERATED {min5, min10, min20, min30, min60,

min120, min360, min720} OPTIONAL, --Need OR

nextHopChainingCount-r15 NextHopChainingCount OPTIONAL, --Cond INACTIVE

dummy SEQUENCE{} OPTIONAL

}

RRC-InactiveConfig-v16xy::= SEQUENCE {

ran-PagingCycle-v16xy ENUMERATED {rf512, rf1024}

}

RAN-NotificationAreaInfo-r15 ::= CHOICE {

cellList-r15 PLMN-RAN-AreaCellList-r15,

ran-AreaConfigList-r15 PLMN-RAN-AreaConfigList-r15

}

PLMN-RAN-AreaCellList-r15 ::= SEQUENCE (SIZE (1..maxPLMN-r15)) OF PLMN-RAN-AreaCell-r15

PLMN-RAN-AreaCell-r15 ::= SEQUENCE {

plmn-Identity-r15 PLMN-Identity OPTIONAL,

ran-AreaCells-r15 SEQUENCE (SIZE (1..32)) OF CellIdentity

}

PLMN-RAN-AreaConfigList-r15 ::= SEQUENCE (SIZE (1..maxPLMN-r15)) OF PLMN-RAN-AreaConfig-r15

PLMN-RAN-AreaConfig-r15 ::= SEQUENCE {

plmn-Identity-r15 PLMN-Identity OPTIONAL,

ran-Area-r15 SEQUENCE (SIZE (1..16)) OF RAN-AreaConfig-r15

}

RAN-AreaConfig-r15 ::= SEQUENCE {

trackingAreaCode-5GC-r15 TrackingAreaCode-5GC-r15,

ran-AreaCodeList-r15 SEQUENCE (SIZE (1..32)) OF RAN-AreaCode-r15 OPTIONAL --Need OR

}

CarrierFreqListUTRA-TDD-r10 ::= SEQUENCE (SIZE (1..maxFreqUTRA-TDD-r10)) OF ARFCN-ValueUTRA

IdleModeMobilityControlInfo ::= SEQUENCE {

freqPriorityListEUTRA FreqPriorityListEUTRA OPTIONAL, -- Need ON

freqPriorityListGERAN FreqsPriorityListGERAN OPTIONAL, -- Need ON

freqPriorityListUTRA-FDD FreqPriorityListUTRA-FDD OPTIONAL, -- Need ON

freqPriorityListUTRA-TDD FreqPriorityListUTRA-TDD OPTIONAL, -- Need ON

bandClassPriorityListHRPD BandClassPriorityListHRPD OPTIONAL, -- Need ON

bandClassPriorityList1XRTT BandClassPriorityList1XRTT OPTIONAL, -- Need ON

t320 ENUMERATED {

min5, min10, min20, min30, min60, min120, min180,

spare1} OPTIONAL, -- Need OR

...,

[[ freqPriorityListExtEUTRA-r12 FreqPriorityListExtEUTRA-r12 OPTIONAL -- Need ON

]],

[[ freqPriorityListEUTRA-v1310 FreqPriorityListEUTRA-v1310 OPTIONAL, -- Need ON

freqPriorityListExtEUTRA-v1310 FreqPriorityListExtEUTRA-v1310 OPTIONAL -- Need ON

]],

[[ freqPriorityListNR-r15 FreqPriorityListNR-r15 OPTIONAL -- Need ON

]]

}

IdleModeMobilityControlInfo-v9e0 ::= SEQUENCE {

freqPriorityListEUTRA-v9e0 SEQUENCE (SIZE (1..maxFreq)) OF FreqPriorityEUTRA-v9e0

}

FreqPriorityListEUTRA ::= SEQUENCE (SIZE (1..maxFreq)) OF FreqPriorityEUTRA

FreqPriorityListExtEUTRA-r12 ::= SEQUENCE (SIZE (1..maxFreq)) OF FreqPriorityEUTRA-r12

FreqPriorityListEUTRA-v1310 ::= SEQUENCE (SIZE (1..maxFreq)) OF FreqPriorityEUTRA-v1310

FreqPriorityListExtEUTRA-v1310 ::= SEQUENCE (SIZE (1..maxFreq)) OF FreqPriorityEUTRA-v1310

FreqPriorityEUTRA ::= SEQUENCE {

carrierFreq ARFCN-ValueEUTRA,

cellReselectionPriority CellReselectionPriority

}

FreqPriorityEUTRA-v9e0 ::= SEQUENCE {

carrierFreq-v9e0 ARFCN-ValueEUTRA-v9e0 OPTIONAL -- Cond EARFCN-max

}

FreqPriorityEUTRA-r12 ::= SEQUENCE {

carrierFreq-r12 ARFCN-ValueEUTRA-r9,

cellReselectionPriority-r12 CellReselectionPriority

}

FreqPriorityEUTRA-v1310 ::= SEQUENCE {

cellReselectionSubPriority-r13 CellReselectionSubPriority-r13 OPTIONAL -- Need ON

}

FreqPriorityListNR-r15 ::= SEQUENCE (SIZE (1..maxFreq)) OF FreqPriorityNR-r15

FreqPriorityNR-r15 ::= SEQUENCE {

carrierFreq-r15 ARFCN-ValueNR-r15,

cellReselectionPriority-r15 CellReselectionPriority,

cellReselectionSubPriority-r15 CellReselectionSubPriority-r13 OPTIONAL -- Need OR

}

FreqsPriorityListGERAN ::= SEQUENCE (SIZE (1..maxGNFG)) OF FreqsPriorityGERAN

FreqsPriorityGERAN ::= SEQUENCE {

carrierFreqs CarrierFreqsGERAN,

cellReselectionPriority CellReselectionPriority

}

FreqPriorityListUTRA-FDD ::= SEQUENCE (SIZE (1..maxUTRA-FDD-Carrier)) OF FreqPriorityUTRA-FDD

FreqPriorityUTRA-FDD ::= SEQUENCE {

carrierFreq ARFCN-ValueUTRA,

cellReselectionPriority CellReselectionPriority

}

FreqPriorityListUTRA-TDD ::= SEQUENCE (SIZE (1..maxUTRA-TDD-Carrier)) OF FreqPriorityUTRA-TDD

FreqPriorityUTRA-TDD ::= SEQUENCE {

carrierFreq ARFCN-ValueUTRA,

cellReselectionPriority CellReselectionPriority

}

BandClassPriorityListHRPD ::= SEQUENCE (SIZE (1..maxCDMA-BandClass)) OF BandClassPriorityHRPD

BandClassPriorityHRPD ::= SEQUENCE {

bandClass BandclassCDMA2000,

cellReselectionPriority CellReselectionPriority

}

BandClassPriorityList1XRTT ::= SEQUENCE (SIZE (1..maxCDMA-BandClass)) OF BandClassPriority1XRTT

BandClassPriority1XRTT ::= SEQUENCE {

bandClass BandclassCDMA2000,

cellReselectionPriority CellReselectionPriority

}

CellInfoListGERAN-r9 ::= SEQUENCE (SIZE (1..maxCellInfoGERAN-r9)) OF CellInfoGERAN-r9

CellInfoGERAN-r9 ::= SEQUENCE {

physCellId-r9 PhysCellIdGERAN,

carrierFreq-r9 CarrierFreqGERAN,

systemInformation-r9 SystemInfoListGERAN

}

CarrierInfoNR-r15 ::= SEQUENCE {

carrierFreq-r15 ARFCN-ValueNR-r15,

subcarrierSpacingSSB-r15 ENUMERATED {kHz15, kHz30, kHz120, kHz240},

smtc-r15 MTC-SSB-NR-r15 OPTIONAL -- Need OP

}

CellInfoListUTRA-FDD-r9 ::= SEQUENCE (SIZE (1..maxCellInfoUTRA-r9)) OF CellInfoUTRA-FDD-r9

CellInfoUTRA-FDD-r9 ::= SEQUENCE {

physCellId-r9 PhysCellIdUTRA-FDD,

utra-BCCH-Container-r9 OCTET STRING

}

CellInfoListUTRA-TDD-r9 ::= SEQUENCE (SIZE (1..maxCellInfoUTRA-r9)) OF CellInfoUTRA-TDD-r9

CellInfoUTRA-TDD-r9 ::= SEQUENCE {

physCellId-r9 PhysCellIdUTRA-TDD,

utra-BCCH-Container-r9 OCTET STRING

}

CellInfoListUTRA-TDD-r10 ::= SEQUENCE (SIZE (1..maxCellInfoUTRA-r9)) OF CellInfoUTRA-TDD-r10

CellInfoUTRA-TDD-r10 ::= SEQUENCE {

physCellId-r10 PhysCellIdUTRA-TDD,

carrierFreq-r10 ARFCN-ValueUTRA,

utra-BCCH-Container-r10 OCTET STRING

}

-- ASN1STOP

| *RRCConnectionRelease* field descriptions |
| --- |
| ***carrierFreq or bandClass***  The carrier frequency (UTRA, E-UTRA, and NR) and band class (HRPD and 1xRTT) for which the associated cellReselectionPriority is applied. For NR, the *ARFCN-ValueNR* corresponds to a GSCN value as specified in TS 38.101 [85]. |
| ***carrierFreqs***  The list of GERAN carrier frequencies organised into one group of GERAN carrier frequencies. |
| ***cellInfoList***  Used to provide system information of one or more cells on the redirected inter-RAT carrier frequency. The system information can be used if, upon redirection, the UE selects an inter-RAT cell indicated by the *physCellId* and *carrierFreq* (GERAN and UTRA TDD) or by the *physCellId* (other RATs). The choice shall match the *redirectedCarrierInfo*. In particular, E-UTRAN only applies value *utra-TDD-r10* in case *redirectedCarrierInfo* is set to *utra-TDD-r10*. |
| ***cellList***  Indicates a list of cells configured as RAN area. For each element, in the absence of *plmn-Identity* the UE considers the registered PLMN. Total number of cells across all PLMNs does not exceed 32. |
| ***cn-Type***  The*cn-Type* is used to indicate that the UE is redirected from 5GC to EPC or 5GC when*redirectedCarrierInfo* indicates E-UTRA frequency. |
| ***drb-ContinueROHC***  This field indicates whether to continue or reset the header compression protocol context for the DRBs configured with the header compression protocol. Presence of the field indicates that the header compression protocol context continues when UE initiates UP-EDT in the same cell, while absence indicates that the header compression protocol context is reset. |
| ***dummy***  This field is not used in the specification. If received it shall be ignored by the UE. |
| ***extendedWaitTime***  Value in seconds for the wait time for Delay Tolerant access requests. |
| ***freqPriorityListX***  Provides a cell reselection priority for each frequency, by means of separate lists for each RAT (including E-UTRA). The UE shall be able to store at least 3 occurrences of *FreqsPriorityGERAN*. If E-UTRAN includes *freqPriorityListEUTRA-v9e0* and/or *freqPriorityListEUTRA-v1310* it includes the same number of entries, and listed in the same order, as in *freqPriorityListEUTRA* (i.e. without suffix). Field *freqPriorityListExt* includes additional neighbouring inter-frequencies, i.e. extending the size of the inter-frequency carrier list using the general principles specified in 5.1.2. EUTRAN only includes *freqPriorityListExtEUTRA* if *freqPriorityListEUTRA* (i.e without suffix) includes *maxFreq* entries. If E-UTRAN includes *freqPriorityListExtEUTRA-v1310* it includes the same number of entries, and listed in the same order, as in *freqPriorityListExtEUTRA-r12.* |
| ***idleModeMobilityControlInfo***  Provides dedicated cell reselection priorities. Used for cell reselection as specified in TS 36.304 [4]. For E-UTRA and UTRA frequencies, a UE that supports multi-band cells for the concerned RAT considers the dedicated priorities to be common for all overlapping bands (i.e. regardless of the ARFCN that is used). |
| ***measIdleConfig***  Indicates a one-shot measurement configuration to be stored and used by the UE while in RRC\_IDLE or RRC\_INACTIVE. |
| ***periodic-RNAU-timer***  Refers to the timer that triggers the periodic RNAU procedure in UE. Value min5 corresponds to 5 minutes, value min10 corresponds to 10 minutes and so on. |
| ***ran-Area***  Indicates whether TA code(s) or RAN area code(s) are used for the RAN notification area. The network uses only TA code(s) or RAN area code(s) to configure a UE. Total number of TACs across all PLMNs does not exceed 16. Total number of RAN-AreaCode across all PLMNs does not exceed 32. |
| ***ran-NotificationAreaInfo***  Network ensures that the UE in RRC\_INACTIVE always has a valid *ran-NotificationAreaInfo*. |
| ***ranAreaConfigList***  Indicates a list of RAN area codes or RA code(s) as RAN area. For each element, in the absence of *plmn-Identity* the UE considers the registered PLMN. |
| ***ran-pagingCycle***  Refers to the UE specific cycle for RAN-initiated paging. Value rf32 corresponds to 32 radio frames, rf64 corresponds to 64 radio frames and so on. |
| ***redirectedCarrierInfo***  The r*edirectedCarrierInfo* indicates a carrier frequency (downlink for FDD) and is used to redirect the UE to an E‑UTRA or an inter-RAT carrier frequency, by means of the cell selection upon leaving RRC\_CONNECTED as specified in TS 36.304 [4]. The value *geran* can only be included after successful security activation when UE is connected to 5GC. |
| ***releaseCause***  The *releaseCause* is used to indicate the reason for releasing the RRC Connection. The cause value *cs-FallbackHighPriority* is only applicable when *redirectedCarrierInfo* is present with the value set to *utra-FDD,* *utra-TDD* or *utra-TDD-r10*. E-UTRAN should not set the *releaseCause* to *loadBalancingTAURequired* or to *cs-FallbackHighPriority* if the *extendedWaitTime* is present. The network should not set the *releaseCause* to *loadBalancingTAURequired* if the UE is connected to 5GC. |
| ***releaseIdleMeasConfig***  Indicates that the UE shall release the idle/inactive measurement configurations, if configured. |
| ***rrc-InactiveConfig***  Indicates configuration for the RRC\_INACTIVE state. The network does not configure this field when the UE is redirected to an inter-RAT carrier frequency. |
| ***smtc***  The SSB periodicity/offset/duration configuration of the redirected target NR frequency. It is based on the timing reference of EUTRAN PCell. If the field is absent, the UE uses the SMTC configured in the *measObjectNR* having the same SSB frequency and subcarrier spacing |
| ***subcarrierSpacingSSB***  Indicate subcarrier spacing of SSB of redirected target NR frequency. Only the values 15 or 30 (<6GHz), 120 kHz or 240 kHz (>6GHz) are applicable. |
| ***systemInformation***  Container for system information of the GERAN cell i.e. one or more System Information (SI) messages as defined in TS 44.018 [45], table 9.1.1. |
| ***t320***  Timer T320 as described in clause 7.3. Value minN corresponds to N minutes. |
| ***utra-BCCH-Container***  Contains System Information Container message as defined in TS 25.331 [19]. |
| ***waitTime***  Wait time value in seconds. |

| Conditional presence | Explanation |
| --- | --- |
| *5GC* | The field is optionally present, Need ON, if the UE is connected to 5GC; otherwise the field is not present. |
| *BLCE-IDLEeDRX* | The field is optionally present, Need OR, if the UE is a BL UE or UE in CE and the UE is connected to 5GC and IDLE mode eDRX is configured and *ran-PagingCycle-r15* is absent; otherwise the field is not present. | |
| *EARFCN-max* | The field is mandatory present if the corresponding *carrierFreq* (i.e. without suffix) is set to *maxEARFCN*. Otherwise the field is not present. |
| *EarlySec* | When the UE is connected to 5GC, the field is mandatory present. When the UE is connected to EPC, the field is optionally present, Need ON, if the UE supports UP-EDT or UP transmission using PUR or early security reactivation and *releaseCause* is set to *rrc-Suspend*; otherwise the field is not present. | |
| *IdleInfoEUTRA* | The field is optionally present, Need OP, if the *IdleModeMobilityControlInfo* (i.e. without suffix) is included and includes *freqPriorityListEUTRA*; otherwise the field is not present. |
| *INACTIVE* | The field is mandatory present in this release. |
| *NoRedirect-r8* | The field is optionally present, Need OP, if the *redirectedCarrierInfo* (i.e. without suffix) is not included; otherwise the field is not present. |
| *Redirection* | The field is optionally present, Need ON, if the *redirectedCarrierInfo* is included and set to *geran*, *utra-FDD*, *utra-TDD* or *utra-TDD-r10*; otherwise the field is not present. |
| *UP-EDT* | The field is optionally present, Need ON, if the UE supports UP-EDT and *releaseCause* is set to *rrc-Suspend*; otherwise the field is not present. |

#### – *RRCConnectionResume*

The *RRCConnectionResume* message is used to resume the suspended RRC connection.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: E‑UTRAN to UE

*RRCConnectionResume* message

-- ASN1START

RRCConnectionResume-r13 ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

c1 CHOICE {

rrcConnectionResume-r13 RRCConnectionResume-r13-IEs,

spare3 NULL,

spare2 NULL,

spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

RRCConnectionResume-r13-IEs ::= SEQUENCE {

radioResourceConfigDedicated-r13 RadioResourceConfigDedicated OPTIONAL, -- Need ON

nextHopChainingCount-r13 NextHopChainingCount,

measConfig-r13 MeasConfig OPTIONAL, -- Need ON

antennaInfoDedicatedPCell-r13 AntennaInfoDedicated-v10i0 OPTIONAL, -- Need ON

drb-ContinueROHC-r13 ENUMERATED {true} OPTIONAL, -- Need OP

lateNonCriticalExtension OCTET STRING OPTIONAL,

rrcConnectionResume-v1430-IEs RRCConnectionResume-v1430-IEs OPTIONAL

}

RRCConnectionResume-v1430-IEs ::= SEQUENCE {

otherConfig-r14 OtherConfig-r9 OPTIONAL, -- Need ON

rrcConnectionResume-v1510-IEs RRCConnectionResume-v1510-IEs OPTIONAL

}

RRCConnectionResume-v1510-IEs ::= SEQUENCE {

sk-Counter-r15 INTEGER (0.. 65535) OPTIONAL, -- Need ON

nr-RadioBearerConfig1-r15 OCTET STRING OPTIONAL, -- Need ON

nr-RadioBearerConfig2-r15 OCTET STRING OPTIONAL, -- Need ON

nonCriticalExtension RRCConnectionResume-v1530-IEs OPTIONAL

}

RRCConnectionResume-v1530-IEs ::= SEQUENCE {

fullConfig-r15 ENUMERATED {true} OPTIONAL, -- Need ON

nonCriticalExtension RRCConnectionResume-v16xy-IEs OPTIONAL

}

RRCConnectionResume-v16xy-IEs ::= SEQUENCE {

newUE-Identity-r16 C-RNTI OPTIONAL, -- Need OP

idleModeMeasurementReq-r16 TypeFFS OPTIONAL, -- Need ON

restoreMCG-SCells ENUMERATED {true} OPTIONAL, -- Need ON

restoreSCG ENUMERATED {true} OPTIONAL, -- Need ON

sCellToAddModList-r16 TypeFFS OPTIONAL, -- Need ON

sCellToReleaseList-r16 SCellToReleaseListExt-r13 OPTIONAL, -- Need ON

sCellGroupToReleaseList-r16 SCellGroupToReleaseList-r15 OPTIONAL, -- Need ON

sCellGroupToAddModList-r16 SCellGroupToAddModList-r15 OPTIONAL, -- Need ON

nr-SecondaryCellGroupConfig OCTET STRING OPTIONAL, -- Need ON

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

| *RRCConnectionResume* field descriptions |
| --- |
| ***drb-ContinueROHC***  This field indicates whether to continue or reset the header compression protocol context for the DRBs configured with EUTRA PDCP and the header compression protocol. Presence of the field indicates that the header compression protocol context continues while absence indicates that the header compression protocol context is reset. |
| ***fullConfig***  Indicates that the full configuration option is applicable for the *RRCConnectionResume* message. |
| ***idleModeMeasurementReq***  This field indicates that the UE shall report the idle/inactive measurements to the network in the *RRCConnectionResumeComplete* message |
| ***newUE-Identity***  C-RNTI used in transmission using PUR, see TS 36.321 [6]. |
| ***nr-RadioBearerConfig1, nr-RadioBearerConfig2***  Includes the NR *RadioBearerConfig* IE as specified in TS 38.331 [82]. The field includes the configuration of RBs configured with NR PDCP. |
| ***nr-SecondaryCellGroupConfig***  Includes the NR *RRCReconfiguration* message as specified in TS 38.331 [82]. In this version of the specification, the NR RRC message only includes fields *secondaryCellGroup* and/ or *measConfig*. This field can be included only when the UE is connected to 5GC. |
| ***restoreMCG-Scells***  Indicates that the UE shall restore the MCG Scell configurations from the UE AS Context or UE Inactive AS Context, if configured. |
| ***restoreSCG***  If included, the UE shall restore the SCG configurations from the UE AS Context or UE Inactive AS Context, if configured. |
| ***sCellGroupToAddModList***  Indicates the SCell group to be added or modified. This field can be included only when the UE is connected to 5GC. |
| ***sCellGroupToReleaseList***  Indicates the SCell group to be released. This field can be included only when the UE is connected to 5GC |
| ***sCellToAddModList***  List of SCells to be added or modified. This field can be included only when the UE is connected to 5GC. |
| ***sCellToReleaseList***  List of SCells to be released. This field can be included only when the UE is connected to 5GC. |
| ***sk-Counter***  A one-shot counter used upon initial configuration of S-KgNB as well as upon refresh of S-KgNB. E-UTRAN provides this field when the UE is configured with an (SN-terminated) RB using S-KgNB. |



#### – *RRCConnectionSetup*

The *RRCConnectionSetup* message is used to establish SRB1.

Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH

Direction: E‑UTRAN to UE

*RRCConnectionSetup message*

-- ASN1START

RRCConnectionSetup ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

c1 CHOICE {

rrcConnectionSetup-r8 RRCConnectionSetup-r8-IEs,

spare7 NULL,

spare6 NULL, spare5 NULL, spare4 NULL,

spare3 NULL, spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

RRCConnectionSetup-r8-IEs ::= SEQUENCE {

radioResourceConfigDedicated RadioResourceConfigDedicated,

nonCriticalExtension RRCConnectionSetup-v8a0-IEs OPTIONAL

}

RRCConnectionSetup-v8a0-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension RRCConnectionSetup-v16xy-IEs OPTIONAL

}

RRCConnectionSetup-v16xy-IEs ::= SEQUENCE {

dedicatedInfoNAS-r16 DedicatedInfoNAS OPTIONAL, -- Need ON

newUE-Identity-r16 C-RNTI OPTIONAL, -- Need OP

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

| *RRCConnectionSetup* field descriptions |
| --- |
| ***dedicatedInfoNAS***  Downlink NAS PDU in case of mobile terminated CP-EDT. E-UTRAN may include this field only if the *RRCConnectionSetup* is in response to *RRCEarlyDataRequest* with establishment cause *mt-Access*. |
| ***newUE-Identity***  C-RNTI used in transmission using PUR, see TS 36.321 [6]. |



#### – *RRCConnectionSetupComplete*

The *RRCConnectionSetupComplete* message is used to confirm the successful completion of an RRC connection establishment.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E‑UTRAN

*RRCConnectionSetupComplete message*

-- ASN1START

RRCConnectionSetupComplete ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

c1 CHOICE{

rrcConnectionSetupComplete-r8 RRCConnectionSetupComplete-r8-IEs,

spare3 NULL, spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

RRCConnectionSetupComplete-r8-IEs ::= SEQUENCE {

selectedPLMN-Identity INTEGER (1..maxPLMN-r11),

registeredMME RegisteredMME OPTIONAL,

dedicatedInfoNAS DedicatedInfoNAS,

nonCriticalExtension RRCConnectionSetupComplete-v8a0-IEs OPTIONAL

}

RRCConnectionSetupComplete-v8a0-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension RRCConnectionSetupComplete-v1020-IEs OPTIONAL

}

RRCConnectionSetupComplete-v1020-IEs ::= SEQUENCE {

gummei-Type-r10 ENUMERATED {native, mapped} OPTIONAL,

rlf-InfoAvailable-r10 ENUMERATED {true} OPTIONAL,

logMeasAvailable-r10 ENUMERATED {true} OPTIONAL,

rn-SubframeConfigReq-r10 ENUMERATED {required, notRequired} OPTIONAL,

nonCriticalExtension RRCConnectionSetupComplete-v1130-IEs OPTIONAL

}

RRCConnectionSetupComplete-v1130-IEs ::= SEQUENCE {

connEstFailInfoAvailable-r11 ENUMERATED {true} OPTIONAL,

nonCriticalExtension RRCConnectionSetupComplete-v1250-IEs OPTIONAL

}

RRCConnectionSetupComplete-v1250-IEs ::= SEQUENCE {

mobilityState-r12 ENUMERATED {normal, medium, high, spare} OPTIONAL,

mobilityHistoryAvail-r12 ENUMERATED {true} OPTIONAL,

logMeasAvailableMBSFN-r12 ENUMERATED {true} OPTIONAL,

nonCriticalExtension RRCConnectionSetupComplete-v1320-IEs OPTIONAL

}

RRCConnectionSetupComplete-v1320-IEs ::= SEQUENCE {

ce-ModeB-r13 ENUMERATED {supported} OPTIONAL,

s-TMSI-r13 S-TMSI OPTIONAL,

attachWithoutPDN-Connectivity-r13 ENUMERATED {true} OPTIONAL,

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

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

nonCriticalExtension RRCConnectionSetupComplete-v1330-IEs OPTIONAL

}

RRCConnectionSetupComplete-v1330-IEs ::= SEQUENCE {

ue-CE-NeedULGaps-r13 ENUMERATED {true} OPTIONAL,

nonCriticalExtension RRCConnectionSetupComplete-v1430-IEs OPTIONAL

}

RRCConnectionSetupComplete-v1430-IEs ::= SEQUENCE {

dcn-ID-r14 INTEGER (0..65535) OPTIONAL,

nonCriticalExtension RRCConnectionSetupComplete-v1530-IEs OPTIONAL

}

RRCConnectionSetupComplete-v1530-IEs ::= SEQUENCE {

logMeasAvailableBT-r15 ENUMERATED {true} OPTIONAL,

logMeasAvailableWLAN-r15 ENUMERATED {true} OPTIONAL,

idleMeasAvailable-r15 ENUMERATED {true} OPTIONAL,

flightPathInfoAvailable-r15 ENUMERATED {true} OPTIONAL,

connectTo5GC-r15 ENUMERATED {true} OPTIONAL,

registeredAMF-r15 RegisteredAMF-r15 OPTIONAL,

s-NSSAI-list-r15 SEQUENCE(SIZE (1..maxNrofS-NSSAI-r15)) OF S-NSSAI-r15 OPTIONAL,

ng-5G-S-TMSI-Bits-r15 CHOICE {

ng-5G-S-TMSI-r15 NG-5G-S-TMSI-r15,

ng-5G-S-TMSI-Part2-r15 BIT STRING (SIZE (8))

} OPTIONAL,

nonCriticalExtension RRCConnectionSetupComplete-v1540-IEs OPTIONAL

}

-- Editors Note: FFS whether to have a separate availability indicator for rel-16 idle/inactive measurements.

RRCConnectionSetupComplete-v1540-IEs ::= SEQUENCE {

gummei-Type-v1540 ENUMERATED {mappedFrom5G-v1540} OPTIONAL,

guami-Type-r15 ENUMERATED {native, mapped} OPTIONAL,

nonCriticalExtension RRCConnectionSetupComplete-v16xy-IEs OPTIONAL

}

RRCConnectionSetupComplete-v16xy-IEs ::= SEQUENCE {

rlos-Request-r16 ENUMERATED {true} OPTIONAL,

cp-CIoT-5GS-Optimisation-r16 ENUMERATED {true} OPTIONAL,

up-CIoT-5GS-Optimisation-r16 ENUMERATED {true} OPTIONAL,

lte-M-r16 ENUMERATED {true} OPTIONAL,

iab-NodeIndication ENUMERATED {true} OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

RegisteredMME ::= SEQUENCE {

plmn-Identity PLMN-Identity OPTIONAL,

mmegi BIT STRING (SIZE (16)),

mmec MMEC

}

RegisteredAMF-r15 ::= SEQUENCE {

plmn-Identity-r15 PLMN-Identity OPTIONAL,

amf-Identifier-r15 AMF-Identifier-r15

}

-- ASN1STOP

| *RRCConnectionSetupComplete* field descriptions |
| --- |
| ***attachWithoutPDN-Connectivity***  This field is used to indicate that the UE performs an Attach without PDN connectivity procedure, as indicated by the upper layers and specified in TS 24.301 [35]. |
| ***cp-CIoT-5GS-Optimisation***  This field is included when the UE supports the Control plane CIoT 5GS optimisation, as indicated by the upper layers, see TS 24.501 [95]. |
| ***cp-CIoT-EPS-Optimisation***  This field is included when the UE supports the Control plane CIoT EPS Optimisation, as indicated by the upper layers, see TS 24.301 [35]. |
| ***ce-ModeB***  Indicates whether the UE supports operation in CE mode B, as specified in TS 36.306 [5]. |
| ***connectTo5GC***  This field is not used in the specification. It shall not be sent by the UE. |
| ***dcn-ID***  The Dedicated Core Network Identity, see TS 23.401 [41]. |
| ***guami-Type***  This field is used to indicate whether the GUAMI included is native (derived from native 5G-GUTI) or mapped (from EPS, derived from EPS GUTI) as specified in TS 24.501 [95]. |
| ***gummei-Type***  This field is used to indicate whether the GUMMEI included is native (assigned by EPC) or mapped. The value native indicates the GUMMEI is native, mapped indicates the GUMMEI is mapped from 2G/3G identifiers, and mappedFrom5G indicates the GUMMEI is mapped from 5G identifiers. A UE that sets *gummei-Type-v1540* to mappedFrom5G shall also include *gummei-Type-r10* and set it to native. |
| ***iab-NodeIndication***  This field is used to indicate that the connection is being established by an IAB-node [9]. |
| ***idleMeasAvailable***  Indication that the UE has idle/inactive measurement report available. |
| ***lte-M***  Indicates the UE is category M. | |
| ***mmegi***  Provides the Group Identity of the registered MME within the PLMN, as provided by upper layers, see TS 23.003 [27]. |
| ***mobilityState***  This field indicates the UE mobility state (as defined in TS 36.304 [4], clause 5.2.4.3) just prior to UE going into RRC\_CONNECTED state. The UE indicates the value of *medium* and *high* when being in Medium-mobility and High-mobility states respectively. Otherwise the UE indicates the value *normal*. |
| ***ng-5G-S-TMSI-Part2*** The leftmost 8 bits of 5G-S-TMSI. |
| ***registeredAMF***  This field is used to transfer the GUAMI of the AMF where the UE is registered, as provided by upper layers, see TS 23.003 [27]. |
| ***registeredMME***  This field is used to transfer the GUMMEI of the MME where the UE is registered, as provided by upper layers. |
| ***rlos-Request***  Indicates whether the UE is initiating RLOS as specified in TS 23.401 [41]. | |
| ***rn-SubframeConfigReq***  If present, this field indicates that the connection establishment is for an RN and whether a subframe configuration is requested or not. |
| ***selectedPLMN-Identity***  Index of the PLMN selected by the UE from the *plmn-IdentityList* fields included in SIB1. 1 if the 1st PLMN is selected from the 1st *plmn-IdentityList* included in SIB1, 2 if the 2nd PLMN is selected from 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. |
| ***s-NSSAI-List***  This field is a list of S-NSSAI as indicated by the upper layers. The UE can report up to eight S-NSSAI per NSSAI, see TS 23.003 [27]. |
| ***ue-CE-NeedULGaps***  Indicates whether the UE needs uplink gaps during continuous uplink transmission in FDD as specified in TS 36.211 [21] and TS 36.306 [5]. |
| ***up-CIoT-5GS-Optimisation***  This field is included when the UE supports the User plane CIoT 5GS optimisation, as indicated by the upper layers, see TS 24.501 [95]. |
| ***up-CIoT-EPS-Optimisation***  This field is included when the UE supports the User plane CIoT EPS Optimisation, as indicated by the upper layers, see TS 24.301 [35]. |

<<unchanged text skipped>>

#### – *SystemInformation*

The *SystemInformation* message is used to convey one or more System Information Blocks or Positioning System Information Blocks. All the SIBs or posSIBs included are transmitted with the same periodicity. *SystemInformation-BR* and *SystemInformation-MBMS* use the same structure as *SystemInformation.*

Signalling radio bearer: N/A

RLC-SAP: TM

Logical channels: BCCH and BR-BCCH

Direction: E‑UTRAN to UE

*SystemInformation message*

-- ASN1START

SystemInformation-BR-r13 ::= SystemInformation

SystemInformation-MBMS-r14 ::= SystemInformation

SystemInformation ::= SEQUENCE {

criticalExtensions CHOICE {

systemInformation-r8 SystemInformation-r8-IEs,

criticalExtensionsFuture-r15 CHOICE {

posSystemInformation-r15 PosSystemInformation-r15-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

}

SystemInformation-r8-IEs ::= SEQUENCE {

sib-TypeAndInfo SEQUENCE (SIZE (1..maxSIB)) OF CHOICE {

sib2 SystemInformationBlockType2,

sib3 SystemInformationBlockType3,

sib4 SystemInformationBlockType4,

sib5 SystemInformationBlockType5,

sib6 SystemInformationBlockType6,

sib7 SystemInformationBlockType7,

sib8 SystemInformationBlockType8,

sib9 SystemInformationBlockType9,

sib10 SystemInformationBlockType10,

sib11 SystemInformationBlockType11,

...,

sib12-v920 SystemInformationBlockType12-r9,

sib13-v920 SystemInformationBlockType13-r9,

sib14-v1130 SystemInformationBlockType14-r11,

sib15-v1130 SystemInformationBlockType15-r11,

sib16-v1130 SystemInformationBlockType16-r11,

sib17-v1250 SystemInformationBlockType17-r12,

sib18-v1250 SystemInformationBlockType18-r12,

sib19-v1250 SystemInformationBlockType19-r12,

sib20-v1310 SystemInformationBlockType20-r13,

sib21-v1430 SystemInformationBlockType21-r14,

sib24-v1530 SystemInformationBlockType24-r15,

sib25-v1530 SystemInformationBlockType25-r15,

sib26-v1530 SystemInformationBlockType26-r15,

sib27-v16xy SystemInformationBlockType27-r16,

sib28-v16xy SystemInformationBlockType28-r16,

sibXX-v16xy SystemInformationBlockTypeXX-r16

},

nonCriticalExtension SystemInformation-v8a0-IEs OPTIONAL

}

SystemInformation-v8a0-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

PosSystemInformation-r15-IEs ::= SEQUENCE {

posSIB-TypeAndInfo-r15 SEQUENCE (SIZE (1..maxSIB)) OF CHOICE {

posSib1-1-r15 SystemInformationBlockPos-r15,

posSib1-2-r15 SystemInformationBlockPos-r15,

posSib1-3-r15 SystemInformationBlockPos-r15,

posSib1-4-r15 SystemInformationBlockPos-r15,

posSib1-5-r15 SystemInformationBlockPos-r15,

posSib1-6-r15 SystemInformationBlockPos-r15,

posSib1-7-r15 SystemInformationBlockPos-r15,

posSib2-1-r15 SystemInformationBlockPos-r15,

posSib2-2-r15 SystemInformationBlockPos-r15,

posSib2-3-r15 SystemInformationBlockPos-r15,

posSib2-4-r15 SystemInformationBlockPos-r15,

posSib2-5-r15 SystemInformationBlockPos-r15,

posSib2-6-r15 SystemInformationBlockPos-r15,

posSib2-7-r15 SystemInformationBlockPos-r15,

posSib2-8-r15 SystemInformationBlockPos-r15,

posSib2-9-r15 SystemInformationBlockPos-r15,

posSib2-10-r15 SystemInformationBlockPos-r15,

posSib2-11-r15 SystemInformationBlockPos-r15,

posSib2-12-r15 SystemInformationBlockPos-r15,

posSib2-13-r15 SystemInformationBlockPos-r15,

posSib2-14-r15 SystemInformationBlockPos-r15,

posSib2-15-r15 SystemInformationBlockPos-r15,

posSib2-16-r15 SystemInformationBlockPos-r15,

posSib2-17-r15 SystemInformationBlockPos-r15,

posSib2-18-r15 SystemInformationBlockPos-r15,

posSib2-19-r15 SystemInformationBlockPos-r15,

posSib3-1-r15 SystemInformationBlockPos-r15,

...,

[[

posSib2-24-r16 SystemInformationBlockPos-r15,

posSib2-25-r16 SystemInformationBlockPos-r15,

posSib4-1-r16 SystemInformationBlockPos-r15,

posSib5-1-r16 SystemInformationBlockPos-r15,

posSib1-8-v16xy SystemInformationBlockPos-r15,

posSib2-20-v16xy SystemInformationBlockPos-r15,

posSib2-21-v16xy SystemInformationBlockPos-r15,

posSib2-22-v16xy SystemInformationBlockPos-r15,

posSib2-23-v16xy SystemInformationBlockPos-r15

]]

},

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

#### – *SystemInformationBlockType1*

*SystemInformationBlockType1* contains information relevant when evaluating if a UE is allowed to access a cell and defines the scheduling of other system information. *SystemInformationBlockType1-BR* uses the same structure as *SystemInformationBlockType1*.

Signalling radio bearer: N/A

RLC-SAP: TM

Logical channels: BCCH and BR-BCCH

Direction: E‑UTRAN to UE

*SystemInformationBlockType1 message*

-- ASN1START

SystemInformationBlockType1-BR-r13 ::= SystemInformationBlockType1

SystemInformationBlockType1 ::= SEQUENCE {

cellAccessRelatedInfo SEQUENCE {

plmn-IdentityList PLMN-IdentityList,

trackingAreaCode TrackingAreaCode,

cellIdentity CellIdentity,

cellBarred ENUMERATED {barred, notBarred},

intraFreqReselection ENUMERATED {allowed, notAllowed},

csg-Indication BOOLEAN,

csg-Identity CSG-Identity OPTIONAL -- Need OR

},

cellSelectionInfo SEQUENCE {

q-RxLevMin Q-RxLevMin,

q-RxLevMinOffset INTEGER (1..8) OPTIONAL -- Need OP

},

p-Max P-Max OPTIONAL, -- Need OP

freqBandIndicator FreqBandIndicator,

schedulingInfoList SchedulingInfoList,

tdd-Config TDD-Config OPTIONAL, -- Cond TDD

si-WindowLength ENUMERATED {

ms1, ms2, ms5, ms10, ms15, ms20,

ms40},

systemInfoValueTag INTEGER (0..31),

nonCriticalExtension SystemInformationBlockType1-v890-IEs OPTIONAL

}

SystemInformationBlockType1-v890-IEs::= SEQUENCE {

lateNonCriticalExtension OCTET STRING (CONTAINING SystemInformationBlockType1-v8h0-IEs) OPTIONAL,

nonCriticalExtension SystemInformationBlockType1-v920-IEs OPTIONAL

}

-- Late non critical extensions

SystemInformationBlockType1-v8h0-IEs ::= SEQUENCE {

multiBandInfoList MultiBandInfoList OPTIONAL, -- Need OR

nonCriticalExtension SystemInformationBlockType1-v9e0-IEs OPTIONAL

}

SystemInformationBlockType1-v9e0-IEs ::= SEQUENCE {

freqBandIndicator-v9e0 FreqBandIndicator-v9e0 OPTIONAL, -- Cond FBI-max

multiBandInfoList-v9e0 MultiBandInfoList-v9e0 OPTIONAL, -- Cond mFBI-max

nonCriticalExtension SystemInformationBlockType1-v10j0-IEs OPTIONAL

}

SystemInformationBlockType1-v10j0-IEs ::= SEQUENCE {

freqBandInfo-r10 NS-PmaxList-r10 OPTIONAL, -- Need OR

multiBandInfoList-v10j0 MultiBandInfoList-v10j0 OPTIONAL, -- Need OR

nonCriticalExtension SystemInformationBlockType1-v10l0-IEs OPTIONAL

}

SystemInformationBlockType1-v10l0-IEs ::= SEQUENCE {

freqBandInfo-v10l0 NS-PmaxList-v10l0 OPTIONAL, -- Need OR

multiBandInfoList-v10l0 MultiBandInfoList-v10l0 OPTIONAL, -- Need OR

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- Regular non critical extensions

SystemInformationBlockType1-v920-IEs ::= SEQUENCE {

ims-EmergencySupport-r9 ENUMERATED {true} OPTIONAL, -- Need OR

cellSelectionInfo-v920 CellSelectionInfo-v920 OPTIONAL, -- Cond RSRQ

nonCriticalExtension SystemInformationBlockType1-v1130-IEs OPTIONAL

}

SystemInformationBlockType1-v1130-IEs ::= SEQUENCE {

tdd-Config-v1130 TDD-Config-v1130 OPTIONAL, -- Cond TDD-OR

cellSelectionInfo-v1130 CellSelectionInfo-v1130 OPTIONAL, -- Cond WB-RSRQ

nonCriticalExtension SystemInformationBlockType1-v1250-IEs OPTIONAL

}

SystemInformationBlockType1-v1250-IEs ::= SEQUENCE {

cellAccessRelatedInfo-v1250 SEQUENCE {

category0Allowed-r12 ENUMERATED {true} OPTIONAL -- Need OP

},

cellSelectionInfo-v1250 CellSelectionInfo-v1250 OPTIONAL, -- Cond RSRQ2

freqBandIndicatorPriority-r12 ENUMERATED {true} OPTIONAL, -- Cond mFBI

nonCriticalExtension SystemInformationBlockType1-v1310-IEs OPTIONAL

}

SystemInformationBlockType1-v1310-IEs ::= SEQUENCE {

hyperSFN-r13 BIT STRING (SIZE (10)) OPTIONAL, -- Need OR

eDRX-Allowed-r13 ENUMERATED {true} OPTIONAL, -- Need OR

cellSelectionInfoCE-r13 CellSelectionInfoCE-r13 OPTIONAL, -- Need OP

bandwidthReducedAccessRelatedInfo-r13 SEQUENCE {

si-WindowLength-BR-r13 ENUMERATED {

ms20, ms40, ms60, ms80, ms120,

ms160, ms200, spare},

si-RepetitionPattern-r13 ENUMERATED {everyRF, every2ndRF, every4thRF,

every8thRF},

schedulingInfoList-BR-r13 SchedulingInfoList-BR-r13 OPTIONAL, -- Cond SI-BR

fdd-DownlinkOrTddSubframeBitmapBR-r13 CHOICE {

subframePattern10-r13 BIT STRING (SIZE (10)),

subframePattern40-r13 BIT STRING (SIZE (40))

} OPTIONAL, -- Need OP

fdd-UplinkSubframeBitmapBR-r13 BIT STRING (SIZE (10)) OPTIONAL, -- Need OP

startSymbolBR-r13 INTEGER (1..4),

si-HoppingConfigCommon-r13 ENUMERATED {on,off},

si-ValidityTime-r13 ENUMERATED {true} OPTIONAL, -- Need OP

systemInfoValueTagList-r13 SystemInfoValueTagList-r13 OPTIONAL -- Need OR

} OPTIONAL, -- Cond BW-reduced

nonCriticalExtension SystemInformationBlockType1-v1320-IEs OPTIONAL

}

SystemInformationBlockType1-v1320-IEs ::= SEQUENCE {

freqHoppingParametersDL-r13 SEQUENCE {

mpdcch-pdsch-HoppingNB-r13 ENUMERATED {nb2, nb4} OPTIONAL, -- Need OR

interval-DLHoppingConfigCommonModeA-r13 CHOICE {

interval-FDD-r13 ENUMERATED {int1, int2, int4, int8},

interval-TDD-r13 ENUMERATED {int1, int5, int10, int20}

} OPTIONAL, -- Need OR

interval-DLHoppingConfigCommonModeB-r13 CHOICE {

interval-FDD-r13 ENUMERATED {int2, int4, int8, int16},

interval-TDD-r13 ENUMERATED { int5, int10, int20, int40}

} OPTIONAL, -- Need OR

mpdcch-pdsch-HoppingOffset-r13 INTEGER (1..maxAvailNarrowBands-r13) OPTIONAL -- Need OR

} OPTIONAL, -- Cond Hopping

nonCriticalExtension SystemInformationBlockType1-v1350-IEs OPTIONAL

}

SystemInformationBlockType1-v1350-IEs ::= SEQUENCE {

cellSelectionInfoCE1-r13 CellSelectionInfoCE1-r13 OPTIONAL, -- Need OP

nonCriticalExtension SystemInformationBlockType1-v1360-IEs OPTIONAL

}

SystemInformationBlockType1-v1360-IEs ::= SEQUENCE {

cellSelectionInfoCE1-v1360 CellSelectionInfoCE1-v1360 OPTIONAL, -- Cond QrxlevminCE1

nonCriticalExtension SystemInformationBlockType1-v1430-IEs OPTIONAL

}

SystemInformationBlockType1-v1430-IEs ::= SEQUENCE {

eCallOverIMS-Support-r14 ENUMERATED {true} OPTIONAL, -- Need OR

tdd-Config-v1430 TDD-Config-v1430 OPTIONAL, -- Cond TDD-OR

cellAccessRelatedInfoList-r14 SEQUENCE (SIZE (1..maxPLMN-1-r14)) OF

CellAccessRelatedInfo-r14 OPTIONAL, -- Need OR

nonCriticalExtension SystemInformationBlockType1-v1450-IEs OPTIONAL

}

SystemInformationBlockType1-v1450-IEs ::= SEQUENCE {

tdd-Config-v1450 TDD-Config-v1450 OPTIONAL, -- Cond TDD-OR

nonCriticalExtension SystemInformationBlockType1-v1530-IEs OPTIONAL

}

SystemInformationBlockType1-v1530-IEs ::= SEQUENCE {

hsdn-Cell-r15 ENUMERATED {true} OPTIONAL, -- Need OR

cellSelectionInfoCE-v1530 CellSelectionInfoCE-v1530 OPTIONAL, -- Need OP

crs-IntfMitigConfig-r15 CHOICE {

crs-IntfMitigEnabled-15 NULL,

crs-IntfMitigNumPRBs-r15 ENUMERATED {n6, n24}

} OPTIONAL, -- Need OR

cellBarred-CRS-r15 ENUMERATED {barred, notBarred},

plmn-IdentityList-v1530 PLMN-IdentityList-v1530 OPTIONAL, -- Need OR

posSchedulingInfoList-r15 PosSchedulingInfoList-r15 OPTIONAL, -- Need OR

cellAccessRelatedInfo-5GC-r15 SEQUENCE {

cellBarred-5GC-r15 ENUMERATED {barred, notBarred},

cellBarred-5GC-CRS-r15 ENUMERATED {barred, notBarred},

cellAccessRelatedInfoList-5GC-r15 SEQUENCE (SIZE (1..maxPLMN-r11)) OF

CellAccessRelatedInfo-5GC-r15

} OPTIONAL, -- Need OP

ims-EmergencySupport5GC-r15 ENUMERATED {true} OPTIONAL, -- Need OR

eCallOverIMS-Support5GC-r15 ENUMERATED {true} OPTIONAL, -- Need OR

nonCriticalExtension SystemInformationBlockType1-v1540-IEs OPTIONAL

}

SystemInformationBlockType1-v1540-IEs ::= SEQUENCE {

si-posOffset-r15 ENUMERATED {true} OPTIONAL, -- Need ON

nonCriticalExtension SystemInformationBlockType1-v16xy-IEs OPTIONAL

}

SystemInformationBlockType1-v16xy-IEs ::= SEQUENCE {

eDRX-Allowed-5GC-r16 ENUMERATED {true} OPTIONAL, -- Need OR

transmissionInControlChRegion-r16 ENUMERATED {true} OPTIONAL, -- Cond BW-reduced

plmn-IdentityList-v16xy PLMN-IdentityList-v16xy OPTIONAL, -- Need OR

nonCriticalExtension SEQUENCE {} OPTIONAL

}

PLMN-IdentityList ::= SEQUENCE (SIZE (1..maxPLMN-r11)) OF PLMN-IdentityInfo

PLMN-IdentityInfo ::= SEQUENCE {

plmn-Identity PLMN-Identity,

cellReservedForOperatorUse ENUMERATED {reserved, notReserved}

}

PLMN-IdentityList-v1530 ::= SEQUENCE (SIZE (1..maxPLMN-r11)) OF PLMN-IdentityInfo-v1530

PLMN-IdentityInfo-v1530 ::= SEQUENCE {

cellReservedForOperatorUse-CRS-r15 ENUMERATED {reserved, notReserved}

}

PLMN-IdentityList-r15::= SEQUENCE (SIZE (1..maxPLMN-r11)) OF PLMN-IdentityInfo-r15

PLMN-IdentityList-v16xy::= SEQUENCE (SIZE (1..maxPLMN-r11)) OF PLMN-IdentityInfo-v16xy

PLMN-IdentityInfo-r15 ::= SEQUENCE {

plmn-Identity-5GC-r15 CHOICE{

plmn-Identity-r15 PLMN-Identity,

plmn-Index-r15 INTEGER (1..maxPLMN-r11)

},

cellReservedForOperatorUse-r15 ENUMERATED {reserved, notReserved},

cellReservedForOperatorUse-CRS-r15 ENUMERATED {reserved, notReserved}

}

PLMN-IdentityInfo-v16xy ::= SEQUENCE {

cp-CIoT-5GS-Optimisation-r16 ENUMERATED {true} OPTIONAL, -- Need OR

up-CIoT-5GS-Optimisation-r16 ENUMERATED {true} OPTIONAL, -- Need OR

iab-support ENUMERATED {true} OPTIONAL -- Need OR

}

SchedulingInfoList ::= SEQUENCE (SIZE (1..maxSI-Message)) OF SchedulingInfo

SchedulingInfo ::= SEQUENCE {

si-Periodicity ENUMERATED {rf8, rf16, rf32, rf64, rf128, rf256, rf512},

sib-MappingInfo SIB-MappingInfo

}

SchedulingInfoList-BR-r13 ::= SEQUENCE (SIZE (1..maxSI-Message)) OF SchedulingInfo-BR-r13

SchedulingInfo-BR-r13 ::= SEQUENCE {

si-Narrowband-r13 INTEGER (1..maxAvailNarrowBands-r13),

si-TBS-r13 ENUMERATED {b152, b208, b256, b328, b408, b504, b600, b712, b808, b936}

}

SIB-MappingInfo ::= SEQUENCE (SIZE (0..maxSIB-1)) OF SIB-Type

SIB-Type ::= ENUMERATED {

sibType3, sibType4, sibType5, sibType6,

sibType7, sibType8, sibType9, sibType10,

sibType11, sibType12-v920, sibType13-v920,

sibType14-v1130, sibType15-v1130,

sibType16-v1130, sibType17-v1250, sibType18-v1250,

..., sibType19-v1250, sibType20-v1310, sibType21-v1430,

sibType24-v1530, sibType25-v1530, sibType26-v1530,

sibType27-v16xy, sibType28-v16xy, sibTypeXX-v16xy}

SystemInfoValueTagList-r13 ::= SEQUENCE (SIZE (1..maxSI-Message)) OF SystemInfoValueTagSI-r13

SystemInfoValueTagSI-r13 ::= INTEGER (0..3)

CellSelectionInfo-v920 ::= SEQUENCE {

q-QualMin-r9 Q-QualMin-r9,

q-QualMinOffset-r9 INTEGER (1..8) OPTIONAL -- Need OP

}

CellSelectionInfo-v1130 ::= SEQUENCE {

q-QualMinWB-r11 Q-QualMin-r9

}

CellSelectionInfo-v1250 ::= SEQUENCE {

q-QualMinRSRQ-OnAllSymbols-r12 Q-QualMin-r9

}

CellAccessRelatedInfo-r14 ::= SEQUENCE {

plmn-IdentityList-r14 PLMN-IdentityList,

trackingAreaCode-r14 TrackingAreaCode,

cellIdentity-r14 CellIdentity

}

CellAccessRelatedInfo-5GC-r15 ::= SEQUENCE {

plmn-IdentityList-r15 PLMN-IdentityList-r15,

ran-AreaCode-r15 RAN-AreaCode-r15 OPTIONAL, -- Need OR

trackingAreaCode-5GC-r15 TrackingAreaCode-5GC-r15,

cellIdentity-5GC-r15 CellIdentity-5GC-r15

}

CellIdentity-5GC-r15 ::= CHOICE{

cellIdentity-r15 CellIdentity,

cellId-Index-r15 INTEGER (1..maxPLMN-r11)

}

PosSchedulingInfoList-r15 ::= SEQUENCE (SIZE (1..maxSI-Message)) OF PosSchedulingInfo-r15

PosSchedulingInfo-r15 ::= SEQUENCE {

posSI-Periodicity-r15 ENUMERATED {rf8, rf16, rf32, rf64, rf128, rf256, rf512},

posSIB-MappingInfo-r15 PosSIB-MappingInfo-r15

}

PosSIB-MappingInfo-r15 ::= SEQUENCE (SIZE (1..maxSIB)) OF PosSIB-Type-r15

PosSIB-Type-r15 ::= SEQUENCE {

encrypted-r15 ENUMERATED { true } OPTIONAL, -- Need OP

gnss-id-r15 GNSS-ID-r15 OPTIONAL, -- Need OP

sbas-id-r15 SBAS-ID-r15 OPTIONAL, -- Need OP

posSibType-r15 ENUMERATED { posSibType1-1,

posSibType1-2,

posSibType1-3,

posSibType1-4,

posSibType1-5,

posSibType1-6,

posSibType1-7,

posSibType2-1,

posSibType2-2,

posSibType2-3,

posSibType2-4,

posSibType2-5,

posSibType2-6,

posSibType2-7,

posSibType2-8,

posSibType2-9,

posSibType2-10,

posSibType2-11,

posSibType2-12,

posSibType2-13,

posSibType2-14,

posSibType2-15,

posSibType2-16,

posSibType2-17,

posSibType2-18,

posSibType2-19,

posSibType3-1,

...,

posSibType1-8-v16xy,

posSibType2-20-v16xy,

posSibType2-21-v16xy,

posSibType2-22-v16xy,

posSibType2-23-v16xy,

posSibType2-24-v16xy,

posSibType2-25-v16xy,

posSibType4-1-v16xy,

posSibType5-1-v16xy

},

...

}

-- ASN1STOP

| *SystemInformationBlockType1* field descriptions |
| --- |
| ***bandwithReducedAccessRelatedInfo***  Access related information for BL UEs and UEs in CE. NOTE 3. |
| ***category0Allowed***  The presence of this field indicates category 0 UEs are allowed to access the cell. |
| ***cellAccessRelatedInfoList***  This field contains a list allowing signalling of access related information per PLMN. One PLMN can be included in only one entry of this list. NOTE 4. |
| ***cellAccessRelatedInfoList-5GC***  This field contains a PLMN list and a list allowing signalling of access related information per PLMN for PLMNs that provides connectivity to 5GC. One PLMN can be included in only one entry of this list. NOTE4 |
| ***cellBarred, cellBarred-CRS***  barred means the cell is barred, as defined in TS 36.304 [4]. |
| ***cellBarred-5GC, cellBarred-5GC-CRS***  barred means the cell is barred for connectivity to 5GC, as defined in TS 36.304 [4]. |
| ***cellIdentity***  Indicates the cell identity. NOTE 2. |
| ***cellId-Index***  The index of the cell ID in the PLMN lists for EPC, indicates UE the corresponding cell ID is used for 5GC. Value 1 indicates the cell ID of the 1st PLMN list for EPC in the SIB1. Value 2 indicates the cell ID of the 2nd PLMN list for EPC, and so on. |
| ***cellReservedForOperatorUse, cellReservedForOperatorUse-CRS***  As defined in TS 36.304 [4]. |
| ***cellSelectionInfoCE***  Cell selection information for BL UEs and UEs in CE. If absent, coverage enhancement S criteria is not applicable. NOTE 3. |
| ***cellSelectionInfoCE1***  Cell selection information for BL UEs and UEs in CE supporting CE Mode B. E-UTRAN includes this IE only if *cellSelectionInfoCE* is present in *SystemInformationBlockType1-BR*. NOTE 3. | |
| ***cp-CIoT-5GS-Optimisation***  This field indicates if the UE is allowed to establish the connection with Control plane CIoT 5GS optimisation, see TS 24.501 [95]. |
| ***crs-IntfMitigConfig***  *crs-IntfMitigEnabled* indicates CRS interference mitigation is enabled for the cell, as specified in TS 36.133 [16], clause 3.6.1.1. For BL UEs or UEs in CE supporting *ce-CRS-IntfMitig,* presence of *crs-IntfMitigNumPRBs* indicates CRS interference mitigation is enabled in the cell, as specified in TS 36.133 [16], clauses 3.6.1.2 and 3.6.1.3, and the value of *crs-IntfMitigNumPRBs* indicates number of PRBs, i.e. 6 or 24 PRBs, for CRS transmission in the central cell BW when CRS interference mitigation is enabled. For UEs not supporting this feature, the behaviour is undefined if this field is configured and the field *cellBarred* in *SystemInformationBlockType1* (*SystemInformationBlockType1-BR* for BL UEs or UEs in CE) is set to *notbarred*. | |
| ***csg-Identity***  Identity of the Closed Subscriber Group the cell belongs to. |
| ***csg-Indication***  If set to TRUE the UE is only allowed to access the cell if it is a CSG member cell, if selected during manual CSG selection or to obtain limited service, see TS 36.304 [4]. |
| ***eCallOverIMS-Support***  Indicates whether the cell supports eCall over IMS services via EPC for UEs as defined in TS 23.401 [41]. If absent, eCall over IMS via EPC is not supported by the network in the cell.NOTE 2. |
| ***eCallOverIMS-Support5GC***  Indicates whether the cell supports eCall over IMS services via 5GC as defined in TS 23.401 [41]. If absent, eCall over IMS via 5GC is not supported by the network in the cell.NOTE 2. |
| ***eDRX-Allowed***  The presence of this field indicates if idle mode extended DRX is allowed in the cell for the UE connected to EPC. The UE shall stop using extended DRX in idle mode if *eDRX-Allowed* is not present when connected to EPC. |
| ***eDRX-Allowed-5GC***  The presence of this field indicates if idle mode extended DRX is allowed in the cell for the UE connected to 5GC. The UE shall stop using extended DRX in idle mode if *eDRX-Allowed-5GC* is not present when connected to 5GC. |
| ***encrypted***  The presence of this field indicates that the posSibType is encrypted as specified in TS 36.355 [54]. |
| ***fdd-DownlinkOrTddSubframeBitmapBR***  The set of valid subframes for FDD downlink or TDD transmissions, see TS 36.213 [23].  If this field is present, *SystemInformationBlockType1-BR-r13* is transmitted in *RRCConnectionReconfiguration*, and if *RRCConnectionReconfiguration* does not include *systemInformationBlockType2Dedicated*, UE may assume the valid subframes in fdd-*DownlinkOrTddSubframeBitmapBR* are not indicated as MBSFN subframes. If this field is not present, the set of valid subframes is the set of non-MBSFN subframes as indicated by *mbsfn-SubframeConfigList*. If neither this field nor *mbsfn-SubframeConfigList* is present, all subframes are considered as valid subframes for FDD downlink transmission, all DL subframes according to the uplink-downlink configuration (see TS 36.211 [21]) are considered as valid subframes for TDD DL transmission, and all UL subframes according to the uplink-downlink configuration (see TS 36.211 [21]) are considered as valid subframes for TDD UL transmission.  The first/leftmost bit corresponds to the subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string divided by 10. Value 0 in the bitmap indicates that the corresponding subframe is invalid for transmission. Value 1 in the bitmap indicates that the corresponding subframe is valid for transmission. |
| ***fdd-UplinkSubframeBitmapBR***  The set of valid subframes for FDD uplink transmissions for BL UEs, see TS 36.213 [23].  If the field is not present, then UE considers all uplink subframes as valid subframes for FDD uplink transmissions.  The first/leftmost bit corresponds to the subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string divided by 10. Value 0 in the bitmap indicates that the corresponding subframe is invalid for transmission. Value 1 in the bitmap indicates that the corresponding subframe is valid for transmission. |
| ***freqBandIndicatorPriority***  If the field is present and supported by the UE, the UE shall prioritize the frequency bands in the *multiBandInfoList* field in decreasing priority order. Only if the UE does not support any of the frequency band in *multiBandInfoList,* the UE shall use the value in *freqBandIndicator* field. Otherwise, the UE applies frequency band according to the rules defined in *multiBandInfoList.* NOTE 2. |
| ***freqBandInfo***  A list of *additionalPmax* and *additionalSpectrumEmission* values, as 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, for the frequency band in *freqBandIndicator*. If E-UTRAN includes *freqBandInfo-v10l0* it includes the same number of entries, and listed in the same order, as in *freqBandInfo-r10*. |
| ***freqHoppingParametersDL***  Downlink frequency hopping parameters for BR versions of SI messages, MPDCCH/PDSCH of paging, MPDCCH/PDSCH of RAR/Msg4 and unicast MPDCCH/PDSCH. If not present, the UE is not configured downlink frequency hopping. |
| ***gnss-ID***  The presence of this field indicates that the *posSibType* is for a specific GNSS. |
| ***hsdn-Cell***  This field indicates this is a HSDN cell as specified in TS 36.304 [4]. |
| ***hyperSFN***  Indicates hyper SFN which increments by one when the SFN wraps around. |
| ***iab-Support***  This field combines both the support of IAB-node and the cell status for IAB-node. If the field is present, the cell supports IAB-nodes and the cell is also considered as a candidate for IAB-nodes; if the field is absent, the cell does not support IAB and/or the cell is barred for IAB-node. | |
| ***ims-EmergencySupport***  Indicates whether the cell supports IMS emergency bearer services via EPC for UEs in limited service mode. If absent, IMS emergency call via EPC is not supported by the network in the cell for UEs in limited service mode.NOTE 2. |
| ***ims-EmergencySupport5GC***  Indicates whether the cell supports IMS emergency bearer services for UEs in limited service mode via 5GC. If absent, IMS emergency call via 5GC is not supported by the network in the cell for UEs in limited service mode. NOTE 2. |
| ***intraFreqReselection***  Used to control cell reselection to intra-frequency cells when the highest ranked cell is barred, or treated as barred by the UE, as specified in TS 36.304 [4].NOTE 2. |
| ***multiBandInfoList***  A list of additional frequency band indicators, as defined in TS 36.101 [42], table 5.5-1, that the cell belongs to. If the UE supports the frequency band in the *freqBandIndicator* field it shall apply that frequency band. Otherwise, the UE shall apply the first listed band which it supports in the *multiBandInfoList* field. If E-UTRAN includes *multiBandInfoList-v9e0* it includes the same number of entries, and listed in the same order, as in *multiBandInfoList* (i.e. without suffix). See Annex D for more descriptions. The UE shall ignore the rule defined in this field description if *freqBandIndicatorPriority*is present and supported by the UE. |
| ***multiBandInfoList-v10j0***  A list of *additionalPmax* and *additionalSpectrumEmission* values, as 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, for the frequency bands in *multiBandInfoList* (i.e. without suffix) and *multiBandInfoList-v9e0*. If E-UTRAN includes *multiBandInfoList-v10j0*, it includes the same number of entries, and listed in the same order, as in *multiBandInfoList* (i.e. without suffix). If E-UTRAN includes *multiBandInfoList-v10l0* it includes the same number of entries, and listed in the same order, as in *multiBandInfoList-v10j0*. |
| ***plmn-IdentityList***  List of PLMN identities. The first listed *PLMN-Identity* is the primary PLMN.If *plmn-IdentityList-v1530* is included, E-UTRAN includes the same number of entries, and listed in the same order, as in *plmn-IdentityList* (without suffix). If *plmn-IdentityList-v16xy* is included, E-UTRAN includes the same number of entries, and listed in the same order, as in *plmn-IdentityList-r15*. NOTE 2. |
| ***plmn-Index***  Index of the PLMN in the *plmn-IdentityList* fields included in SIB1 for EPC, indicating the same PLMN ID is connected to 5GC. Value 1 indicates the 1st PLMN in the 1st *plmn-IdentityList* included in SIB1, value 2 indicates the 2nd PLMN in the same *plmn-IdentityList*, or when no more PLMNs 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 6. |
| ***p-Max***  Value applicable for the cell. If absent the UE applies the maximum power according to its capability as specified in TS 36.101 [42], clause 6.2.2.NOTE 2. |
| ***posSIB-MappingInfo***  List of the posSIBs mapped to this *SystemInformation* message. |
| ***posSibType***  The positioning SIB type is defined in TS 36.355 [54]. |
| ***q-QualMin***  Parameter "Qqualmin" in TS 36.304 [4]. If *cellSelectionInfo-v920* is not present, the UE applies the (default) value of negative infinity for Qqualmin. NOTE 1. |
| ***q-QualMinRSRQ-OnAllSymbols***  If this field is present and supported by the UE, the UE shall, when performing RSRQ measurements, perform RSRQ measurement on all OFDM symbols in accordance with TS 36.214 [48]. NOTE 1. |
| ***q-QualMinOffset***  Parameter "Qqualminoffset" in TS 36.304 [4]. Actual value Qqualminoffset = field value [dB]. If *cellSelectionInfo-v920* is not present or the field is not present, the UE applies the (default) value of 0 dB for Qqualminoffset.Affects the minimum required quality level in the cell. |
| ***q-QualMinWB***  If this field is present and supported by the UE, the UE shall, when performing RSRQ measurements, use a wider bandwidth in accordance with TS 36.133 [16]. NOTE 1. |
| ***q-RxLevMinOffset***  Parameter Qrxlevminoffset in TS 36.304 [4]. Actual value Qrxlevminoffset = field value \* 2 [dB]. If absent, the UE applies the (default) value of 0 dB for Qrxlevminoffset*.* Affects the minimum required Rx level in the cell. |
| ***sbas-ID***  The presence of this field indicates that the *posSibType* is for a specific SBAS. |
| ***sib-MappingInfo***  List of the SIBs mapped to this *SystemInformation* message. There is no mapping information of SIB2; it is always present in the first *SystemInformation* message listed in the *schedulingInfoList* list. |
| ***si-HoppingConfigCommon***  Frequency hopping activation/deactivation for BR versions of SI messages and MPDCCH/PDSCH of paging. |
| ***si-Narrowband***  This field indicates the index of a narrowband used to broadcast the SI message towards BL UEs and UEs in CE, see TS 36.211 [21], clause 6.4.1 and TS 36.213 [23], clause 7.1.6. Field values (1..*maxAvailNarrowBands-r13*) correspond to narrowband indices (0..[*maxAvailNarrowBands-r13*-1]) as specified in TS 36.211 [21]. |
| ***si-RepetitionPattern***  Indicates the radio frames within the SI window used for SI message transmission. Value everyRF corresponds to every radio frame, value every2ndRF corresponds to every 2 radio frames, and so on. The first transmission of the SI message is transmitted from the first radio frame of the SI window. |
| ***si-Periodicity, posSI-Periodicity***  Periodicity of the SI-message in radio frames, such that rf8 denotes 8 radio frames, rf16 denotes 16 radio frames, and so on. If the *si-posOffset* is configured, the *posSI-Periodicity* of rf8 cannot be used. |
| ***si-posOffset***  This field, if present and set to *true* indicates that the SI messages in *PosSchedulingInfoList* are scheduled with an offset of 8 radio frames compared to SI messages in *SchedulingInfoList*. *si-posOffset* may be present only if the shortest configured SI message periodicity for SI messages in *SchedulingInfoList* is 80ms. |
| ***si-TBS***  This field indicates the transport block size information used to broadcast the SI message towards BL UEs and UEs in CE, see TS 36.213 [23], Table 7.1.7.2.1-1, for a 6 PRB bandwidth and a QPSK modulation. |
| ***schedulingInfoList-BR***  Indicates additional scheduling information of SI messages for BL UEs and UEs in CE. It includes the same number of entries, and listed in the same order, as in *schedulingInfoList* (without suffix). |
| ***si-ValidityTime***  Indicates system information validity timer. If set to TRUE, the timer is set to 3h, otherwise the timer is set to 24h. |
| ***si-WindowLength, si-WindowLength-BR***  Common SI scheduling window for all SIs. Unit in milliseconds, where ms1 denotes 1 millisecond, ms2 denotes 2 milliseconds and so on. In case s*i-WindowLength-BR-r13* is present and the UE is a BL UE or a UE in CE, the UE shall use s*i-WindowLength-BR-r13* and ignore the original field *si-WindowLength* (without suffix). UEs other than BL UEs or UEs in CE shall ignore the extension field s*i-WindowLength-BR-r13.* |
| ***startSymbolBR***  For BL UEs and UEs in CE, indicates the OFDM starting symbol for any MPDCCH, PDSCH scheduled on the same cell except the PDSCH carrying *SystemInformationBlockType1-BR*, see TS 36.213 [23]. Values 1, 2, and 3 are applicable for *dl-Bandwidth* greater than 10 resource blocks. Values 2, 3, and 4 are applicable otherwise. |
| ***systemInfoValueTagList***  Indicates SI message specific value tags for BL UEs and UEs in CE. It includes the same number of entries, and listed in the same order, as in *schedulingInfoList* (without suffix). |
| ***systemInfoValueTagSI***  SI message specific value tag as specified in clause 5.2.1.3. Common for all SIBs within the SI message other than MIB, SIB1, SIB10, SIB11, SIB12 and SIB14. |
| ***systemInfoValueTag***  Common for all SIBs other than MIB, MIB-MBMS, SIB1, SIB1-MBMS, SIB10, SIB11, SIB12 and SIB14. Change of MIB, MIB-MBMS, SIB1 and SIB1-MBMS is detected by acquisition of the corresponding message. |
| ***tdd-Config***  Specifies the TDD specific physical channel configurations. NOTE 2. |
| ***trackingAreaCode/trackingAreaCode-5GC***  A *trackingAreaCode* that is common for all the PLMNs listed. NOTE2. NOTE 5. |
| ***transmissionInControlChRegion***  Indicates, for BL UEs and UEs in CE, LTE control channel region may be used for DL broadcast transmission. NOTE 3. |
| ***up-CIoT-5GS-Optimisation***  This field indicates if the UE is allowed to resume the connection with User plane CIoT 5GS optimisation, see TS 24.501 [95]. |

NOTE 1: The value the UE applies for parameter "Qqualmin" in TS 36.304 [4] depends on the *q-QualMin* fields signalled by E-UTRAN and supported by the UE. In case multiple candidate options are available, the UE shall select the highest priority candidate option according to the priority order indicated by the following table (top row is highest priority).

|  |  |  |
| --- | --- | --- |
| q-QualMinRSRQ-OnAllSymbols | q-QualMinWB | Value of parameter "Qqualmin" in TS 36.304 [4] |
| Included | Included | *q-QualMinRSRQ-OnAllSymbols* – (*q-QualMin* – *q-QualMinWB*) |
| Included | Not included | *q-QualMinRSRQ-OnAllSymbols* |
| Not included | Included | *q-QualMinWB* |
| Not included | Not included | *q-QualMin* |

NOTE 2: E-UTRAN sets this field to the same value for all instances of SIB1 message that are broadcasted within the same cell.

NOTE 3: E-UTRAN configures this field only in the BR version of SIB1 message.

NOTE 4: E-UTRAN configures at most 6 EPC PLMNs in total (i.e. across all the PLMN lists except for PLMN lists in *cellAccessRelatedInfoList-5GC* in SIB1). E-UTRAN configures at most 6 5GC PLMNs in total (i.e. across all the PLMN lists in *cellAccessRelatedInfoList-5GC* in SIB1).

NOTE 5: E-UTRAN configures only one value for this parameter per PLMN.

NOTE 6: E-UTRAN configures *plmn-Index* only if the *cellBarred* is set to *notBarred.*

| Conditional presence | Explanation |
| --- | --- |
| *BW-reduced* | The field is optional present, Need OR, if *schedulingInfoSIB1-BR* in MIB is set to a value greater than 0. Otherwise the field is not present. |
| *FBI-max* | The field is mandatory present if *freqBandIndicator* (i.e. without suffix) is set to *maxFBI*. Otherwise the field is not present. |
| *mFBI* | The field is optional present, Need OR, if *multiBandInfoList* is present. Otherwise the field is not present. |
| *mFBI-max* | The field is mandatory present if one or more entries in *multiBandInfoList* (i.e. without suffix, introduced in -v8h0) is set to *maxFBI*. Otherwise the field is not present. |
| *RSRQ* | The field is mandatory present if SIB3 is being broadcast and *threshServingLowQ* is present in SIB3; otherwise optionally present, Need OP. |
| *RSRQ2* | The field is mandatory present if *q-QualMinRSRQ-OnAllSymbols* is present in SIB3; otherwise it is not present and the UE shall delete any existing value for this field. |
| *Hopping* | The field is mandatory present if *si-HoppingConfigCommon* field is broadcasted and set to *on*. Otherwise the field is optionally present, need OP. |
| *QrxlevminCE1* | The field is optionally present, Need OR, if *q-RxLevMinCE1-r13* is set below -140 dBm. Otherwise the field is not present. |
| *TDD* | This field is mandatory present for TDD; it is not present for FDD and the UE shall delete any existing value for this field. |
| *TDD-OR* | The field is optional present for TDD, need OR; it is not present for FDD. |
| *WB-RSRQ* | The field is optionally present, need OP if the measurement bandwidth indicated by *allowedMeasBandwidth* in *systemInformationBlockType3* is 50 resource blocks or larger; otherwise it is not present. |
| *SI-BR* | The field is mandatory present if *schedulingInfoSIB1-BR* is included in MIB with a value greater than 0. Otherwise the field is not present. |

Next change

### 6.3.1 System information blocks

<<unchanged text skipped>>

#### – *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

]]

}

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 SystemInformationBlockType2-v16xy-IEs OPTIONAL

}

SystemInformationBlockType2-v16xy-IEs ::= SEQUENCE {

idleModeMeasurements-r16 TypeFFS OPTIONAL, -- Need OR

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-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. |
| ***idleModeMeasurements***  This field indicates that the eNB can process indication of idle/inactive measurements from UE. |
| ***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***  This field indicates whether UE connected to EPC is allowed to report the AS release assistance indication via 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. 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, applies.  For TDD: This parameter is absent and it is equal to the downlink frequency. NOTE 1. |
| ***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.

<<unchanged text skipped>>

#### – *SystemInformationBlockType4*

The IE *SystemInformationBlockType4* contains neighbouring cell related information relevant only for intra-frequency cell re-selection. The IE includes cells with specific re-selection parameters as well as blacklisted cells.

*SystemInformationBlockType4* information element

-- ASN1START

SystemInformationBlockType4 ::= SEQUENCE {

intraFreqNeighCellList IntraFreqNeighCellList OPTIONAL, -- Need OR

intraFreqBlackCellList IntraFreqBlackCellList OPTIONAL, -- Need OR

csg-PhysCellIdRange PhysCellIdRange OPTIONAL, -- Cond CSG

...,

lateNonCriticalExtension OCTET STRING OPTIONAL,

[[ intraFreqNeighHSDN-CellList-r15 IntraFreqNeighHSDN-CellList-r15 OPTIONAL -- Need OR

]],

[[ rss-ConfigCarrierInfo-r16 RSS-ConfigCarrierInfo-r16 OPTIONAL -- Cond RSS

]]

}

IntraFreqNeighCellList ::= SEQUENCE (SIZE (1..maxCellIntra)) OF IntraFreqNeighCellInfo

IntraFreqNeighHSDN-CellList-r15 ::= SEQUENCE (SIZE (1..maxCellIntra)) OF PhysCellIdRange

IntraFreqNeighCellInfo ::= SEQUENCE {

physCellId PhysCellId,

q-OffsetCell Q-OffsetRange,

...,

[[ rss-MeasPowerBias-r16 ENUMERATED {dB-6, dB-3, dB0, dB3, dB6, dB9, dB12, spare} OPTIONAL -- Cond RSS

]]

}

IntraFreqBlackCellList ::= SEQUENCE (SIZE (1..maxCellBlack)) OF PhysCellIdRange

-- ASN1STOP

| *SystemInformationBlockType4* field descriptions |
| --- |
| ***csg-PhysCellIdRange***  Set of physical cell identities reserved for CSG cells on the frequency on which this field was received. The received *csg-PhysCellIdRange* applies if less than 24 hours has elapsed since it was received and the UE is camped on a cell of the same primary PLMN where this field was received. The 3 hour validity restriction (clause 5.2.1.3) does not apply to this field. The UE shall not apply any stored *csg-PhysCellIdRange* when it is in *any cell selection* state defined in TS 36.304 [4]. |
| ***intraFreqBlackCellList***  List of blacklisted intra-frequency neighbouring cells. |
| ***intraFreqNeighbCellList***  List of intra-frequency neighbouring cells with specific cell re-selection parameters. |
| ***intraFreqNeighHSDN-CellList***  List of intra-frequency neighbouring HSDN cells as specified in TS 36.304 [4]. |
| ***q-OffsetCell***  Parameter "Qoffsets,n" in TS 36.304 [4]. |
| ***rss-ConfigCarrierInfo***  RSS configurations for this carrier frequency. If absent and *rss-MeasConfig* is included in *SIB2*, RSS is collocated (time and frequency domain) in all cells. | |
| ***rss-MeasPowerBias***  Power bias in dB relative to q\_offset of neighbour cell CRS. Value dB-6 corresponds to -6 dB, value dB-3 corresponds to -3 dB and so on. If the field is absent, measurement based on RSS is not applicable for the neighbour cell indicated by corresponding *physCellID*. | |

| Conditional presence | Explanation |
| --- | --- |
| *CSG* | This field is optional, need OP, for non-CSG cells, and mandatory for CSG cells. |
| *RSS* | This field is optional, need OR, if *rss-MeasConfig* is included in SIB2. Otherwise the field is not present, and the UE shall delete any existing value for this field. |

#### – *SystemInformationBlockType5*

The IE *SystemInformationBlockType5* contains information relevant only for inter-frequency cell re-selection i.e. information about other E‑UTRA frequencies and inter-frequency neighbouring cells relevant for cell re-selection. The IE includes cell re-selection parameters common for a frequency as well as cell specific re-selection parameters.

*SystemInformationBlockType5* information element

-- ASN1START

SystemInformationBlockType5 ::= SEQUENCE {

interFreqCarrierFreqList InterFreqCarrierFreqList,

...,

lateNonCriticalExtension OCTET STRING (CONTAINING SystemInformationBlockType5-v8h0-IEs) OPTIONAL,

[[ interFreqCarrierFreqList-v1250 InterFreqCarrierFreqList-v1250 OPTIONAL, -- Need OR

interFreqCarrierFreqListExt-r12 InterFreqCarrierFreqListExt-r12 OPTIONAL -- Need OR

]],

[[ interFreqCarrierFreqListExt-v1280 InterFreqCarrierFreqListExt-v1280 OPTIONAL -- Need OR

]],

[[ interFreqCarrierFreqList-v1310 InterFreqCarrierFreqList-v1310 OPTIONAL, -- Need OR

interFreqCarrierFreqListExt-v1310 InterFreqCarrierFreqListExt-v1310 OPTIONAL -- Need OR

]],

[[ interFreqCarrierFreqList-v1350 InterFreqCarrierFreqList-v1350 OPTIONAL, -- Need OR

interFreqCarrierFreqListExt-v1350 InterFreqCarrierFreqListExt-v1350 OPTIONAL -- Need OR

]],

[[ interFreqCarrierFreqListExt-v1360 InterFreqCarrierFreqListExt-v1360 OPTIONAL -- Need OR

]],

[[ scptm-FreqOffset-r14 INTEGER (1..8) OPTIONAL -- Need OP

]],

[[ interFreqCarrierFreqList-v1530 InterFreqCarrierFreqList-v1530 OPTIONAL, -- Need OR

interFreqCarrierFreqListExt-v1530 InterFreqCarrierFreqListExt-v1530 OPTIONAL, -- Need OR

measIdleConfigSIB-r15 MeasIdleConfigSIB-r15 OPTIONAL -- Need OR

]],

[[ interFreqCarrierFreqList-v16xy InterFreqCarrierFreqList-v16xy OPTIONAL, -- Need OR

interFreqCarrierFreqListExt-v16xy InterFreqCarrierFreqListExt-v16xy OPTIONAL -- Need OR

]]

}

-- Late non critical extensions

SystemInformationBlockType5-v8h0-IEs ::= SEQUENCE {

interFreqCarrierFreqList-v8h0 SEQUENCE (SIZE (1..maxFreq)) OF InterFreqCarrierFreqInfo-v8h0 OPTIONAL, -- Need OP

nonCriticalExtension SystemInformationBlockType5-v9e0-IEs OPTIONAL

}

SystemInformationBlockType5-v9e0-IEs ::= SEQUENCE {

interFreqCarrierFreqList-v9e0 SEQUENCE (SIZE (1..maxFreq)) OF InterFreqCarrierFreqInfo-v9e0 OPTIONAL, -- Need OR

nonCriticalExtension SystemInformationBlockType5-v10j0-IEs OPTIONAL

}

SystemInformationBlockType5-v10j0-IEs ::= SEQUENCE {

interFreqCarrierFreqList-v10j0 SEQUENCE (SIZE (1..maxFreq)) OF InterFreqCarrierFreqInfo-v10j0 OPTIONAL, -- Need OR

nonCriticalExtension SystemInformationBlockType5-v10l0-IEs OPTIONAL

}

SystemInformationBlockType5-v10l0-IEs ::= SEQUENCE {

interFreqCarrierFreqList-v10l0 SEQUENCE (SIZE (1..maxFreq)) OF InterFreqCarrierFreqInfo-v10l0 OPTIONAL, -- Need OR

nonCriticalExtension SystemInformationBlockType5-v13a0-IEs OPTIONAL

}

SystemInformationBlockType5-v13a0-IEs ::= SEQUENCE {

-- Late non critical extensions from REL-10 upto REL-12

lateNonCriticalExtension OCTET STRING OPTIONAL, -- Need OR

interFreqCarrierFreqList-v13a0 InterFreqCarrierFreqList-v13a0 OPTIONAL, -- Need OR

-- Late non critical extensions from REL-13

nonCriticalExtension SEQUENCE {} OPTIONAL

}

InterFreqCarrierFreqList ::= SEQUENCE (SIZE (1..maxFreq)) OF InterFreqCarrierFreqInfo

InterFreqCarrierFreqList-v1250 ::= SEQUENCE (SIZE (1.. maxFreq)) OF InterFreqCarrierFreqInfo-v1250

InterFreqCarrierFreqList-v1310 ::= SEQUENCE (SIZE (1.. maxFreq)) OF InterFreqCarrierFreqInfo-v1310

InterFreqCarrierFreqList-v1350 ::= SEQUENCE (SIZE (1.. maxFreq)) OF InterFreqCarrierFreqInfo-v1350

InterFreqCarrierFreqList-v13a0 ::= SEQUENCE (SIZE (1.. maxFreq)) OF InterFreqCarrierFreqInfo-v1360

InterFreqCarrierFreqList-v1530 ::= SEQUENCE (SIZE (1.. maxFreq)) OF InterFreqCarrierFreqInfo-v1530

InterFreqCarrierFreqList-v16xy ::= SEQUENCE (SIZE (1..maxFreq)) OF InterFreqCarrierFreqInfo-v16xy

InterFreqCarrierFreqListExt-r12 ::= SEQUENCE (SIZE (1.. maxFreq)) OF InterFreqCarrierFreqInfo-r12

InterFreqCarrierFreqListExt-v1280 ::= SEQUENCE (SIZE (1.. maxFreq)) OF InterFreqCarrierFreqInfo-v10j0

InterFreqCarrierFreqListExt-v1310 ::= SEQUENCE (SIZE (1.. maxFreq)) OF InterFreqCarrierFreqInfo-v1310

InterFreqCarrierFreqListExt-v1350 ::= SEQUENCE (SIZE (1.. maxFreq)) OF InterFreqCarrierFreqInfo-v1350

InterFreqCarrierFreqListExt-v1360 ::= SEQUENCE (SIZE (1..maxFreq)) OF InterFreqCarrierFreqInfo-v1360

InterFreqCarrierFreqListExt-v1530 ::= SEQUENCE (SIZE (1..maxFreq)) OF InterFreqCarrierFreqInfo-v1530

InterFreqCarrierFreqListExt-v16xy ::= SEQUENCE (SIZE (1..maxFreq)) OF InterFreqCarrierFreqInfo-v16xy

InterFreqCarrierFreqInfo ::= SEQUENCE {

dl-CarrierFreq ARFCN-ValueEUTRA,

q-RxLevMin Q-RxLevMin,

p-Max P-Max OPTIONAL, -- Need OP

t-ReselectionEUTRA T-Reselection,

t-ReselectionEUTRA-SF SpeedStateScaleFactors OPTIONAL, -- Need OP

threshX-High ReselectionThreshold,

threshX-Low ReselectionThreshold,

allowedMeasBandwidth AllowedMeasBandwidth,

presenceAntennaPort1 PresenceAntennaPort1,

cellReselectionPriority CellReselectionPriority OPTIONAL, -- Need OP

neighCellConfig NeighCellConfig,

q-OffsetFreq Q-OffsetRange DEFAULT dB0,

interFreqNeighCellList InterFreqNeighCellList OPTIONAL, -- Need OR

interFreqBlackCellList InterFreqBlackCellList OPTIONAL, -- Need OR

...,

[[ q-QualMin-r9 Q-QualMin-r9 OPTIONAL, -- Need OP

threshX-Q-r9 SEQUENCE {

threshX-HighQ-r9 ReselectionThresholdQ-r9,

threshX-LowQ-r9 ReselectionThresholdQ-r9

} OPTIONAL -- Cond RSRQ

]],

[[ q-QualMinWB-r11 Q-QualMin-r9 OPTIONAL -- Cond WB-RSRQ

]]

}

InterFreqCarrierFreqInfo-v8h0 ::= SEQUENCE {

multiBandInfoList MultiBandInfoList OPTIONAL -- Need OR

}

InterFreqCarrierFreqInfo-v9e0 ::= SEQUENCE {

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

multiBandInfoList-v9e0 MultiBandInfoList-v9e0 OPTIONAL -- Need OR

}

InterFreqCarrierFreqInfo-v10j0 ::= SEQUENCE {

freqBandInfo-r10 NS-PmaxList-r10 OPTIONAL, -- Need OR

multiBandInfoList-v10j0 MultiBandInfoList-v10j0 OPTIONAL -- Need OR

}

InterFreqCarrierFreqInfo-v10l0 ::= SEQUENCE {

freqBandInfo-v10l0 NS-PmaxList-v10l0 OPTIONAL, -- Need OR

multiBandInfoList-v10l0 MultiBandInfoList-v10l0 OPTIONAL -- Need OR

}

InterFreqCarrierFreqInfo-v1250 ::= SEQUENCE {

reducedMeasPerformance-r12 ENUMERATED {true} OPTIONAL, -- Need OP

q-QualMinRSRQ-OnAllSymbols-r12 Q-QualMin-r9 OPTIONAL -- Cond RSRQ2

}

InterFreqCarrierFreqInfo-r12 ::= SEQUENCE {

dl-CarrierFreq-r12 ARFCN-ValueEUTRA-r9,

q-RxLevMin-r12 Q-RxLevMin,

p-Max-r12 P-Max OPTIONAL, -- Need OP

t-ReselectionEUTRA-r12 T-Reselection,

t-ReselectionEUTRA-SF-r12 SpeedStateScaleFactors OPTIONAL, -- Need OP

threshX-High-r12 ReselectionThreshold,

threshX-Low-r12 ReselectionThreshold,

allowedMeasBandwidth-r12 AllowedMeasBandwidth,

presenceAntennaPort1-r12 PresenceAntennaPort1,

cellReselectionPriority-r12 CellReselectionPriority OPTIONAL, -- Need OP

neighCellConfig-r12 NeighCellConfig,

q-OffsetFreq-r12 Q-OffsetRange DEFAULT dB0,

interFreqNeighCellList-r12 InterFreqNeighCellList OPTIONAL, -- Need OR

interFreqBlackCellList-r12 InterFreqBlackCellList OPTIONAL, -- Need OR

q-QualMin-r12 Q-QualMin-r9 OPTIONAL, -- Need OP

threshX-Q-r12 SEQUENCE {

threshX-HighQ-r12 ReselectionThresholdQ-r9,

threshX-LowQ-r12 ReselectionThresholdQ-r9

} OPTIONAL, -- Cond RSRQ

q-QualMinWB-r12 Q-QualMin-r9 OPTIONAL, -- Cond WB-RSRQ

multiBandInfoList-r12 MultiBandInfoList-r11 OPTIONAL, -- Need OR

reducedMeasPerformance-r12 ENUMERATED {true} OPTIONAL, -- Need OP

q-QualMinRSRQ-OnAllSymbols-r12 Q-QualMin-r9 OPTIONAL, -- Cond RSRQ2

...

}

InterFreqCarrierFreqInfo-v1310 ::= SEQUENCE {

cellReselectionSubPriority-r13 CellReselectionSubPriority-r13 OPTIONAL, -- Need OP

redistributionInterFreqInfo-r13 RedistributionInterFreqInfo-r13 OPTIONAL, --Need OP

cellSelectionInfoCE-r13 CellSelectionInfoCE-r13 OPTIONAL, -- Need OP

t-ReselectionEUTRA-CE-r13 T-ReselectionEUTRA-CE-r13 OPTIONAL -- Need OP

}

InterFreqCarrierFreqInfo-v1350 ::= SEQUENCE {

cellSelectionInfoCE1-r13 CellSelectionInfoCE1-r13 OPTIONAL -- Need OP

}

InterFreqCarrierFreqInfo-v1360 ::= SEQUENCE {

cellSelectionInfoCE1-v1360 CellSelectionInfoCE1-v1360 OPTIONAL -- Cond QrxlevminCE1

}

InterFreqCarrierFreqInfo-v1530 ::= SEQUENCE {

hsdn-Indication-r15 BOOLEAN,

interFreqNeighHSDN-CellList-r15 InterFreqNeighHSDN-CellList-r15 OPTIONAL, -- Need OR

cellSelectionInfoCE-v1530 CellSelectionInfoCE-v1530 OPTIONAL -- Need OP

}

InterFreqCarrierFreqInfo-v16xy ::= SEQUENCE {

rss-ConfigCarrierInfo-r16 RSS-ConfigCarrierInfo-r16 OPTIONAL, -- Cond RSS

rss-AssistanceInfoList-r16 SEQUENCE (SIZE (1..maxCellInter)) OF RSS-AssistanceInfo-r16 OPTIONAL -- Cond RSS-Info

}

RSS-AssistanceInfo-r16 ::= SEQUENCE {

rss-MeasPowerBias-r16 ENUMERATED {dB-6, dB-3, dB0, dB3, dB6, dB9, dB12, rssNotUsed}

}

InterFreqNeighCellList ::= SEQUENCE (SIZE (1..maxCellInter)) OF InterFreqNeighCellInfo

InterFreqNeighHSDN-CellList-r15 ::= SEQUENCE (SIZE (1..maxCellInter)) OF PhysCellIdRange

InterFreqNeighCellInfo ::= SEQUENCE {

physCellId PhysCellId,

q-OffsetCell Q-OffsetRange

}

InterFreqBlackCellList ::= SEQUENCE (SIZE (1..maxCellBlack)) OF PhysCellIdRange

RedistributionInterFreqInfo-r13 ::= SEQUENCE {

redistributionFactorFreq-r13 RedistributionFactor-r13 OPTIONAL, --Need OP

redistributionNeighCellList-r13 RedistributionNeighCellList-r13 OPTIONAL --Need OP

}

RedistributionNeighCellList-r13 ::= SEQUENCE (SIZE (1..maxCellInter)) OF RedistributionNeighCell-r13

RedistributionNeighCell-r13 ::= SEQUENCE {

physCellId-r13 PhysCellId,

redistributionFactorCell-r13 RedistributionFactor-r13

}

RedistributionFactor-r13 ::= INTEGER(1..10)

-- ASN1STOP

| *SystemInformationBlockType5* field descriptions |
| --- |
| ***cellSelectionInfoCE***  Parameters included in coverage enhancement S criteria for BL UEs and UEs in CE, applicable for inter-frequency neighbour cells. If absent, coverage enhancement S criteria is not applicable. |
| ***cellSelectionInfoCE1***  Parameters included in coverage enhancement S criteria for BL UEs and UEs in CE supporting CE Mode B. E-UTRAN includes this IE only in an entry of *InterFreqCarrierFreqList-v1350* or *InterFreqCarrierFreqListExt-v1350* if *cellSelectionInfoCE* is present in the corresponding entry of *InterFreqCarrierFreqList-v1310* or *InterFreqCarrierFreqListExt-v1310* is present. | |
| ***freqBandInfo***  A list of *additionalPmax* and *additionalSpectrumEmission* values, as 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, for the frequency band represented by *dl-CarrierFreq* for which cell reselection parameters are common. If E-UTRAN includes *freqBandInfo-v10l0* it includes the same number of entries, and listed in the same order, as in *freqBandInfo-r10*. |
| ***hsdn-Indication***  Indicates whether there are deployed HSDN cells or not on the the DL carrier frequency indicated by *dl-CarrierFreq-r12*. |
| ***interFreqBlackCellList***  List of blacklisted inter-frequency neighbouring cells. |
| ***interFreqCarrierFreqList***  List of neighbouring inter-frequencies. E-UTRAN does not configure more than one entry for the same physical frequency regardless of the E-ARFCN used to indicate this. If E-UTRAN includes *interFreqCarrierFreqList-v8h0*, *interFreqCarrierFreqList-v9e0*, *InterFreqCarrierFreqList-v1250, InterFreqCarrierFreqList-v1310, InterFreqCarrierFreqList-v1350,* *InterFreqCarrierFreqList-v13a0* and/or *InterFreqCarrierFreqList-v1530*, it includes the same number of entries, and listed in the same order, as in *interFreqCarrierFreqList* (i.e. without suffix). See Annex D for more descriptions. |
| ***interFreqCarrierFreqListExt***  List of additional neighbouring inter-frequencies, i.e. extending the size of the inter-frequency carrier list using the general principles specified in 5.1.2. E-UTRAN does not configure more than one entry for the same physical frequency regardless of the E-ARFCN used to indicate this. EUTRAN may include *interFreqCarrierFreqListExt* even if *interFreqCarrierFreqList* (i.e without suffix) does not include *maxFreq* entries. If E-UTRAN includes *InterFreqCarrierFreqListExt-v1310, InterFreqCarrierFreqListExt-v1350,* *InterFreqCarrierFreqListExt-v1360* and/or *InterFreqCarrierFreqListExt-v1530,* it includes the same number of entries, and listed in the same order, as in *interFreqCarrierFreqListExt-r12.* |
| ***interFreqNeighCellList***  List of inter-frequency neighbouring cells with specific cell re-selection parameters. |
| ***interFreqNeighHSDN-CellList***  List of inter-frequency neighbouring HSDN cells as specified in TS 36.304 [4]. |
| ***multiBandInfoList***  Indicates the list of frequency bands in addition to the band represented by dl-CarrierFreq for which cell reselection parameters are common. E-UTRAN indicates at most *maxMultiBands* frequency bands (i.e. the total number of entries across both *multiBandInfoList* and *multiBandInfoList-v9e0* is below this limit). |
| ***multiBandInfoList-v10j0***  A list of *additionalPmax* and *additionalSpectrumEmission* values, as 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, for the frequency bands in *multiBandInfoList* (i.e. without suffix) and *multiBandInfoList-v9e0*. If E-UTRAN includes *multiBandInfoList-v10j0*, it includes the same number of entries, and listed in the same order, as in *multiBandInfoList* (i.e. without suffix). If E-UTRAN includes *multiBandInfoList-v10l0* it includes the same number of entries, and listed in the same order, as in *multiBandInfoList-v10j0.* |
| ***p-Max***  Value applicable for the neighbouring E-UTRA cells on this carrier frequency. If absent the UE applies the maximum power according to its capability as specified in TS 36.101 [42], clause 6.2.2. |
| ***q-OffsetCell***  Parameter "Qoffsets,n" in TS 36.304 [4]. |
| ***q-OffsetFreq***  Parameter "Qoffsetfrequency" in TS 36.304 [4]. |
| ***q-QualMin***  Parameter "Qqualmin" in TS 36.304 [4]. If the field is not present, the UE applies the (default) value of negative infinity for Qqualmin. NOTE 1. |
| ***q-QualMinRSRQ-OnAllSymbols***  If this field is present and supported by the UE, the UE shall, when performing RSRQ measurements, perform RSRQ measurement on all OFDM symbols in accordance with TS 36.214 [48]. NOTE 1. |
| ***q-QualMinWB***  If this field is present and supported by the UE, the UE shall, when performing RSRQ measurements, use a wider bandwidth in accordance with TS 36.133 [16]. NOTE 1. |
| ***redistributionFactorFreq***  Parameter *redistributionFactorFreq* in TS 36.304 [4]. |
| ***redistributionFactorCell***  Parameter *redistributionFactorCell* in TS 36.304 [4]. |
| ***reducedMeasPerformance***  Value *TRUE* indicates that the neighbouring inter-frequency is configured for reduced measurement performance, see TS 36.133 [16]. If the field is not included, the neighbouring inter-frequency is configured for normal measurement performance, see TS 36.133 [16]. |
| ***rss-AssistanceInfoList***  List of RSS assistance information which is used for the *physCellId* in *InterFreqNeighCellList*. If E-UTRAN includes *rss-AssistanceInfoList*, it includes the same number of entries, and listed in the same order, as in *interFreqNeighCellList.* |
| ***rss-ConfigCarrierInfo***  RSS configuration for this carrier frequency. If absent and *rss-MeasConfig* is included in *SIB2*, RSS is collocated (time and frequency domain) in all cells on this carrier. |
| ***rss-MeasPowerBias***  Power bias in dB relative to q\_offset of neighbour cell CRS. Value dB-6 corresponds to -6 dB, value dB-3 corresponds to -3 dB and so on. Value *rssNotUsed* indicates measurement based on RSS is not applicable for the corresponding neighbour cell. |
| ***scptm-FreqOffset***  Parameter QoffsetSCPTM in TS 36.304 [4]. Actual value QoffsetSCPTM = field value \* 2 [dB]. If the field is not present, the UE uses infinite dBs for the SC-PTM frequency offset with cell ranking as specified in TS 36.304 [4]. |
| ***threshX-High***  Parameter "ThreshX, HighP" in TS 36.304 [4]. |
| ***threshX-HighQ***  Parameter "ThreshX, HighQ" in TS 36.304 [4]. |
| ***threshX-Low***  Parameter "ThreshX, LowP" in TS 36.304 [4]. |
| ***threshX-LowQ***  Parameter "ThreshX, LowQ" in TS 36.304 [4]. |
| ***t-ReselectionEUTRA***  Parameter "TreselectionEUTRA" in TS 36.304 [4]. |
| ***t-ReselectionEUTRA-SF***  Parameter "Speed dependent ScalingFactor for TreselectionEUTRA" in TS 36.304 [4]. If the field is not present, the UE behaviour is specified in TS 36.304 [4]. |

NOTE 1: The value the UE applies for parameter "Qqualmin" in TS 36.304 [4] depends on the *q-QualMin* fields signalled by E-UTRAN and supported by the UE. In case multiple candidate options are available, the UE shall select the highest priority candidate option according to the priority order indicated by the following table (top row is highest priority).

|  |  |  |
| --- | --- | --- |
| q-QualMinRSRQ-OnAllSymbols | q-QualMinWB | Value of parameter "Qqualmin" in TS 36.304 [4] |
| Included | Included | *q-QualMinRSRQ-OnAllSymbols* – (*q-QualMin* – *q-QualMinWB*) |
| Included | Not included | *q-QualMinRSRQ-OnAllSymbols* |
| Not included | Included | *q-QualMinWB* |
| Not included | Not included | *q-QualMin* |

| Conditional presence | Explanation |
| --- | --- |
| *dl-FreqMax* | The field is mandatory present if, for the corresponding entry in *InterFreqCarrierFreqList* (i.e. without suffix), *dl-CarrierFreq* (i.e. without suffix) is set to *maxEARFCN*. Otherwise the field is not present. |
| *QrxlevminCE1* | The field is optionally present, Need OR, if *q-RxLevMinCE1-r13* is set below -140 dBm. Otherwise the field is not present. |
| *RSRQ* | The field is mandatory present if *threshServingLowQ* is present in *systemInformationBlockType3*; otherwise it is not present. |
| *RSRQ2* | The field is mandatory present for all EUTRA carriers listed in SIB5 if *q-QualMinRSRQ-OnAllSymbols* is present in SIB3; otherwise it is not present and the UE shall delete any existing value for this field. |
| *RSS* | This field is optional, need OR, if *rss-MeasConfig* is included in SIB2. Otherwise the field is not present, and the UE shall delete any existing value for this field. |
| *RSS-Info* | This field is optionally present, need OR, if *interFreqNeighCellList* is configured and *rss-MeasConfig* is included in SIB2. Otherwise the field is not present, and the UE shall delete any existing value for this field. |
| *WB-RSRQ* | The field is optionally present, need OP if the measurement bandwidth indicated by *allowedMeasBandwidth* is 50 resource blocks or larger; otherwise it is not present. |

<<unchanged text skipped>>

#### *– SystemInformationBlockTypeXX*

The IE *SystemInformationBlockTypeXX* contains common resource reservation, e.g. for coexistence with NR.

*SystemInformationBlockTypeXX* information element

-- ASN1START

SystemInformationBlockTypeXX-r16 ::= SEQUENCE {

resourceReservationConfigCommonDL-r16 ResourceReservationConfigDL-r16 OPTIONAL, -- Need OR

resourceReservationConfigCommonUL-r16 ResourceReservationConfigUL-r16 OPTIONAL, -- Need OR

puncturedSubcarriersDL-r16 BIT STRING (SIZE (2)) OPTIONAL, -- Need OR

lateNonCriticalExtension OCTET STRING OPTIONAL,

...

}

-- ASN1STOP

| *SystemInformationBlockTypeXX* field descriptions | |
| --- | --- |
| ***puncturedSubcarriersDL***  Indicates number of punctured DL subcarriers and their locations, see TS 36.211 [31]. | |

Next change

### 6.3.2 Radio resource control information elements

<<unchanged text skipped>>

#### – *Alpha*

The IE *Alpha* is used to indicate parameter α, see TS 36.213 [23], clause 5.1.1.1 and 5.1.3.1. Value al0 corresponds to 0, al04 corresponds to value 0.4, al05 to 0.5, al06 to 0.6, al07 to 0.7, al08 to 0.8, al09 to 0.9 and al1 corresponds to 1.

*Alpha* information element

-- ASN1START

-- ASN1STOP

<<unchanged text skipped>>

#### – *CRS-ChEstMPDCCH-Config*

The IE *CRS-ChEstMPDCCH-Config* is used to configure and enable use of CRS for MPDCCH performance improvement, see TS 36.211 [21], clause 6.8B.5 and TS 36.213 [23], clause 9.1.5.

*CRS-ChEstMPDCCH-Config* information elements

-- ASN1START

CRS-ChEstMPDCCH-ConfigCommon-r16 ::= SEQUENCE {

powerRatio-r16 ENUMERATED {dB-4dot77, dB-3, dB-1dot77, dB0, dB1, dB2, dB3, dB4dot77}

}

CRS-ChEstMPDCCH-ConfigDedicated-r16 ::= SEQUENCE {

powerRatio-r16 ENUMERATED {dB-4dot77, dB-3, dB-1dot77, dB0, dB1, dB2, dB3,

dB4dot77} OPTIONAL, -- Cond setup

localizedMappingType-r16 ENUMERATED {predefined, csi-Based, reciprocityBased} DEFAULT predefined

}

-- ASN1STOP

| *CRS-ChEstMPDCCH-Config* field descriptions |
| --- |
| ***powerRatio***  Power ratio in dB between DMRS and CRS antenna ports of MPDCCH, see TS 36.213 [23], clause 5.2. Value dB-4dot77 corresponds to -4.77 dB, value dB-3 corresponds to -3 dB and so on. |
| ***localizedMappingType***  DMRS mapping type for MPDCCH performance improvement with localized MPDCCH allocation for CE mode A/B in RRC\_CONNECTED, see TS 36.213 [23], clause 9.1.5. Value *predefined* corresponds to predefined mapping, value *csi-Based* corresponds to CSI-based mapping, and value *reciprocityBased* corresponds to reciprocity based mapping. Reciprocity based mapping is only applicable for TDD. |

| Conditional presence | Explanation |
| --- | --- |
| setup | The field is mandatory present if *CRS-ChEstMPDCCH-ConfigDedicated* is set to *setup* and this field has not been configured in *CRS-ChEstMPDCCH-ConfigCommon*; otherwise the field is optional, need ON. |

<<unchanged text skipped>>

#### – *EPDCCH-Config*

The IE EPDCCH-Config specifies the subframes and resource blocks for EPDCCH monitoring that E-UTRAN may configure for a serving cell.

*EPDCCH-Config* information element

-- ASN1START

EPDCCH-Config-r11 ::= SEQUENCE{

config-r11 CHOICE {

release NULL,

setup SEQUENCE {

subframePatternConfig-r11 CHOICE {

release NULL,

setup SEQUENCE {

subframePattern-r11 MeasSubframePattern-r10

}

} OPTIONAL, -- Need ON

startSymbol-r11 INTEGER (1..4) OPTIONAL, -- Need OP

setConfigToReleaseList-r11 EPDCCH-SetConfigToReleaseList-r11 OPTIONAL, -- Need ON

setConfigToAddModList-r11 EPDCCH-SetConfigToAddModList-r11 OPTIONAL -- Need ON

}

}

}

EPDCCH-SetConfigToAddModList-r11 ::= SEQUENCE (SIZE(1..maxEPDCCH-Set-r11)) OF EPDCCH-SetConfig-r11

EPDCCH-SetConfigToReleaseList-r11 ::= SEQUENCE (SIZE(1..maxEPDCCH-Set-r11)) OF EPDCCH-SetConfigId-r11

EPDCCH-SetConfig-r11 ::= SEQUENCE {

setConfigId-r11 EPDCCH-SetConfigId-r11,

transmissionType-r11 ENUMERATED {localised, distributed},

resourceBlockAssignment-r11 SEQUENCE{

numberPRB-Pairs-r11 ENUMERATED {n2, n4, n8},

resourceBlockAssignment-r11 BIT STRING (SIZE(4..38))

},

dmrs-ScramblingSequenceInt-r11 INTEGER (0..503),

pucch-ResourceStartOffset-r11 INTEGER (0..2047),

re-MappingQCL-ConfigId-r11 PDSCH-RE-MappingQCL-ConfigId-r11 OPTIONAL, -- Need OR

...,

[[ csi-RS-ConfigZPId2-r12 CHOICE {

release NULL,

setup CSI-RS-ConfigZPId-r11

} OPTIONAL -- Need ON

]],

[[ numberPRB-Pairs-v1310 CHOICE {

release NULL,

setup ENUMERATED {n6}

} OPTIONAL, -- Need ON

mpdcch-config-r13 CHOICE {

release NULL,

setup SEQUENCE {

csi-NumRepetitionCE-r13 ENUMERATED {sf1, sf2, sf4, sf8, sf16, sf32},

mpdcch-pdsch-HoppingConfig-r13 ENUMERATED {on,off},

mpdcch-StartSF-UESS-r13 CHOICE {

fdd-r13 ENUMERATED {v1, v1dot5, v2, v2dot5, v4,

v5, v8, v10},

tdd-r13 ENUMERATED {v1, v2, v4, v5, v8, v10,

v20, spare1}

},

mpdcch-NumRepetition-r13 ENUMERATED {r1, r2, r4, r8, r16,

r32, r64, r128, r256},

mpdcch-Narrowband-r13 INTEGER (1.. maxAvailNarrowBands-r13)

}

} OPTIONAL -- Need ON

]]

}

EPDCCH-SetConfigId-r11 ::= INTEGER (0..1)

-- ASN1STOP

|  |
| --- |
| *EPDCCH-Config* field descriptions |
| ***csi-NumRepetitionCE***  Number of subframes for CSI reference resource, see TS 36.213 [23]. Value sf1 corresponds to 1 subframe, sf2 corresponds to 2 subframes and so on. |
| ***csi-RS-ConfigZPId2***  Indicates the rate matching parameters in addition to those indicated by *re-MappingQCL-ConfigId*. E-UTRAN configures this field only when tm10 is configured. |
| ***dmrs-ScramblingSequenceInt***  The DMRS scrambling sequence initialization parameter  or  defined in TS 36.211 [21], clause 6.10.3A.1. |
| ***EPDCCH-SetConfig***  Provides EPDCCH configuration set. See TS 36.213 [23], clause 9.1.4. E-UTRAN configures at least one *EPDCCH-SetConfig when EPDCCH-Config* is configured. For BL UEs or UEs in CE, EUTRAN does not configure more than one EPDCCH-SetConfig. |
| ***mpdcch-Narrowband***  Parameter: cid:image015.png@01D1F4C1.16D3F4B0, see TS 36.211 [21], clause 6.8B.5. Field values (1..*maxAvailNarrowBands-r13*) correspond to narrowband indices (0..[*maxAvailNarrowBands-r13*-1]) as specified in TS 36.211 [21]. |
| ***mpdcch-NumRepetition***  Maximum numbers of repetitions for UE-SS for MPDCCH, see TS 36.213 [23]. |
| ***mpdcch-pdsch-HoppingConfig***  Frequency hopping activation/deactivation for unicast MPDCCH/PDSCH, see TS 36.211 [21]. E-UTRAN does not configure the value *on* if *freqHoppingParametersDL* is not present in *SystemInformationBlockType1*. |
| ***mpdcch-StartSF-UESS***  Starting subframe configuration for an MPDCCH UE-specific search space, see TS 36.213 [23]. Value v1 corresponds to 1, value v1dot5 corresponds to 1.5, and so on. |
| ***numberPRB-Pairs***  Indicates the number of physical resource-block pairs used for the EPDCCH set. Value n2 corresponds to 2 physical resource-block pairs; n4 corresponds to 4 physical resource-block pairs and so on. Value n8 is not supported if *dl-Bandwidth* is set to 6 resource blocks. EUTRAN only configures value up to n6 for BL UEs or UEs in CE. Value n6 is only applicable to BL UEs or UEs in CE. |
| ***pucch-ResourceStartOffset***  PUCCH format 1a, 1b and 3 resource starting offset for the EPDCCH set. See TS 36.213 [23], clause 10.1. |
| ***re-MappingQCL-ConfigId***  Indicates the starting OFDM symbol, the related rate matching parameters and quasi co-location assumption for EPDCCH when the UE is configured with tm10. This field provides the identity of a configured *PDSCH-RE-MappingQCL-Config*. E-UTRAN configures this field only when tm10 is configured. |
| ***resourceBlockAssignment***  Indicates the index to a specific combination of physical resource-block pair for EPDCCH set. See TS 36.213 [23], clause 9.1.4.4. The size of *resourceBlockAssignment* is specified in TS 36.213 [23], clause 9.1.4.4, and based on *numberPRB-Pairs* andthe signalled value of *dl-Bandwidth.* If *numberPRB-Pairs-v1310* field is present, the total number of physical resource-block pairs is 6 and it is composed of one subset of 2 physical resource-block pairs and another subset of 4 physical resource-block pairs, and the *resourceBlockAssignment* field defines the subset of 2 physical resource-block pairs. |
| ***setConfigId***  Indicates the identity of the EPDCCH configuration set. |
| ***startSymbol***  Indicates the OFDM starting symbol for any EPDCCH and PDSCH scheduled by EPDCCH on the same cell, see TS 36.213 [23], clause 9.1.4.1. If not present, the UE shall release the configuration and shall derive the starting OFDM symbol of EPDCCH and PDSCH scheduled by EPDCCH from PCFICH. Values 1, 2, and 3 are applicable for *dl-Bandwidth* greater than 10 resource blocks. Values 2, 3, and 4 are applicable otherwise. E-UTRAN does not configure the field for UEs configured with tm10. |
| ***subframePatternConfig***  Configures the subframes which the UE shall monitor the UE-specific search space on EPDCCH, except for pre-defined rules in TS 36.213 [23], clause 9.1.4. If the field is not configured when EPDCCH is configured, the UE shall monitor the UE-specific search space on EPDCCH in all subframes except for pre-defined rules in TS 36.213 [23], clause 9.1.4. |
| ***transmissionType***  Indicates whether distributed or localized EPDCCH transmission mode is used as defined in TS 36.211 [21], clause 6.8A.1. |

<<unchanged text skipped>>

#### *– GWUS-Config*

The IE *GWUS-Config* is used to specify the Group WUS configuration. For the UEs supporting GWUS, E-UTRAN uses GWUS to indicate that the UE shall attempt to receive paging in that cell, see TS 36.304 [4].

*GWUS-Config* information element

-- ASN1START

GWUS-Config-r16 ::= SEQUENCE {

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

commonSequence-r16 ENUMERATED {g0, g126} OPTIONAL, -- Need OR

timeParameters-r16 GWUS-TimeParameters-r16 OPTIONAL, -- Cond NoWUSr15

resourceConfigDRX-r16 GWUS-ResourceConfig-r16,

resourceConfig-eDRX-Short-r16 GWUS-ResourceConfig-r16 OPTIONAL, -- Need OP

resourceConfig-eDRX-Long-r16 GWUS-ResourceConfig-r16 OPTIONAL, -- Cond TimeOffset

probThreshList-r16 GWUS-ProbThreshList-r16 OPTIONAL, -- Cond ProbabilityBased

groupNarrowBandList-r16 SEQUENCE (SIZE (1..maxAvailNarrowBands-r13)) OF BOOLEAN OPTIONAL -- Need OR

}

GWUS-TimeParameters-r16 ::= SEQUENCE {

maxDurationFactor-r16 ENUMERATED {one32th, one16th, one8th, one4th},

numPOs-r16 ENUMERATED {n1, n2, n4, spare1} DEFAULT n1,

timeOffsetDRX-r16 ENUMERATED {ms40, ms80, ms160, ms240},

timeOffset-eDRX-Short-r16 ENUMERATED {ms40, ms80, ms160, ms240},

timeOffset-eDRX-Long-r16 ENUMERATED {ms1000, ms2000} OPTIONAL, -- Need OP

numDRX-CyclesRelaxed-r16 ENUMERATED {n1, n2, n4, n8} OPTIONAL, -- Need OR

powerBoost-r16 ENUMERATED {dB0, dB1dot8, dB3, dB4dot8} OPTIONAL, -- Need OR

...

}

GWUS-ResourceConfig-r16 ::= SEQUENCE {

resourceMappingPattern-r16 GWUS-ResourceMappingPattern-r16,

numGroupsList-r16 SEQUENCE (SIZE (1..maxGWUS-Resources-r16)) OF GWUS-NumGroups-r16 OPTIONAL, -- Need OP

groupsForServiceList-r16 SEQUENCE (SIZE (1..maxGWUS-ProbThresholds-r16)) OF INTEGER (1..maxGWUS-Groups-1-r16) OPTIONAL -- Cond ProbabilityBased

}

GWUS-ResourceMappingPattern-r16 ::= CHOICE {

resourcePatternWithLegacy ENUMERATED {rp-ID0, rp-ID1, rp-ID2, rp-ID3, rp-ID4, rp-ID5, rp-ID6, rp-ID7},

resourcePatternWithoutLegacy SEQUENCE {

freqLocation-r16 ENUMERATED {n0, n2},

resourcePattern-r16 ENUMERATED {rp-ID0, rp-ID2, rp-ID4, rp-ID6}

}

}

GWUS-NumGroups-r16 ::= ENUMERATED {n1, n2, n4, n8}

GWUS-ProbThreshList-r16 ::= SEQUENCE (SIZE (1..maxGWUS-ProbThresholds-r16)) OF GWUS-PagingProbThresh-r16

GWUS-PagingProbThresh-r16 ::= ENUMERATED {p20, p30, p40, p50, p60, p70, p80, p90}

-- ASN1STOP

| *GWUS-Config* field descriptions |
| --- |
| ***commonSequence***  Presence of the field indicates common WUS sequence is configured. Value *g0* indicates common WUS sequence for the shared WUS resource corresponds to *g = 0*, and value *g126* indicates common WUS sequence for the shared WUS resource corresponds to *g = 126*, see TS 36.211 [21]. |
| ***groupAlternation***  Presence of the field enables WUS group alternation between the two or more WUS resources for the gap type, see TS 36.304 [4]. |
| ***groupNarrowBandList***  List indicating which narrowbands support group WUS see TS 36.304 [4]. First entry in the list indicates WUS support for first narrowband, second entry in the list indicates WUS support for second narrowband, and so on. If this list is absent, group WUS supported on all narrowbands. |
| ***groupsForServiceList***  Number of WUS groups for each paging probability group see TS 36.304 [4]. The first entry is for the first probability group, second entry is for the second paging probability group, and so on. Any WUS groups from the list if WUS groups defined in the *numWUS-GroupsPerResourceList* that are not assigned to a probability group is considered to be part of the UE ID based group only list. |
| ***freqLocation***  Frequency location of WUS resource 0 within paging narrowband. Value *n0* corresponds to WUS in the 1st and 2nd PRB and value *n2* represents the 3rd and 4th PRB. |
| ***numGroupsList***  List of WUS groups for each WUS resource see TS 36.304 [4]. First entry corresponds to the first resource, second entry corresponds to the second resource, and so on. *numGroupsList* is mandatory present in *resourceConfigDRX*. If *numGroupsList* is not present in *resourceConfig-eDRX-Short*, parameterfor DRX WUS resource applies for short eDRX WUS resource. If *numGroupsList* is not present in *resourceConfig-eDRX-Long*, parameterfor short eDRX WUS resource applies for long eDRX WUS resource. |
| ***probThreshList***  Paging probability thresholds corresponding to the paging probability groups, see TS 36.304 [4]. Value *p20* corresponds to 20%, value *p30* corresponds to 30%, and so on. |
| ***resourceConfigDRX, resourceConfig-eDRX-Short, resourceConfig-eDRX-Long***  WUS resource configured for each gap type see TS 36.304 [4]. If *resourceConfig-eDRX-Short* is not present, DRX WUS parameters apply for short eDRX WUS resource. If *resourceConfig-eDRX-Long* is not present, short eDRX WUS parameters apply for long eDRX WUS resource. |
| ***resourcePattern***  Identifies the WUS resource mapping to time/frequency as defined in TS 36.304 [4]. If *wus-Config-r15* is present in *SystemInformationBlockType2*, the field is set to value *resourcePatternWithLegacy*; otherwise the field is set to value *resourcePatternWithoutLegacy*. If the field is set to *resourcePatternWithLegacy*, frequency location of WUS resource 0 is defined by *freqLocation-r15* (in *WUS-Config*). If the field is set to *resourcePatternWithoutLegacy*, frequency location of WUS resource 0 is defined by *freqLocation-r16*. |
| ***timeParameters***  Time domain WUS configuration information. For individual field descriptions, see *WUS-Config.* |

| Conditional presence | Explanation |
| --- | --- |
| *NoWUSr15* | The field is mandatory present if *wus-Config-r15* is not present in *SystemInformationBlockType2*; otherwise the field is not present, and the UE shall delete any existing value for this field. |
| *ProbabilityBased* | The field is mandatory present if paging probability based WUS group selection is configured; otherwise the field is not present and the UE shall delete any existing value for this field. |
| *TimeOffset* | The field is optionally present, Need OP, if *timeOffset-eDRX-Long* is present in *timeParameters*; otherwise the field is not present, and the UE shall delete any existing value for this field. |

<<unchanged text skipped>>

#### – *MAC-MainConfig*

The IE *MAC-MainConfig* is used to specify the MAC main configuration for signalling and data radio bearers. All MAC main configuration parameters can be configured independently per Cell Group (i.e. MCG or SCG), unless explicitly specified otherwise.

*MAC-MainConfig* information element

-- ASN1START

MAC-MainConfig ::= SEQUENCE {

ul-SCH-Config SEQUENCE {

maxHARQ-Tx ENUMERATED {

n1, n2, n3, n4, n5, n6, n7, n8,

n10, n12, n16, n20, n24, n28,

spare2, spare1} OPTIONAL, -- Need ON

periodicBSR-Timer PeriodicBSR-Timer-r12 OPTIONAL, -- Need ON

retxBSR-Timer RetxBSR-Timer-r12,

ttiBundling BOOLEAN

} OPTIONAL, -- Need ON

drx-Config DRX-Config OPTIONAL, -- Need ON

timeAlignmentTimerDedicated TimeAlignmentTimer,

phr-Config CHOICE {

release NULL,

setup SEQUENCE {

periodicPHR-Timer ENUMERATED {sf10, sf20, sf50, sf100, sf200,

sf500, sf1000, infinity},

prohibitPHR-Timer ENUMERATED {sf0, sf10, sf20, sf50, sf100,

sf200, sf500, sf1000},

dl-PathlossChange ENUMERATED {dB1, dB3, dB6, infinity}

}

} OPTIONAL, -- Need ON

...,

[[ sr-ProhibitTimer-r9 INTEGER (0..7) OPTIONAL -- Need ON

]],

[[ mac-MainConfig-v1020 SEQUENCE {

sCellDeactivationTimer-r10 ENUMERATED {

rf2, rf4, rf8, rf16, rf32, rf64, rf128,

spare} OPTIONAL, -- Need OP

extendedBSR-Sizes-r10 ENUMERATED {setup} OPTIONAL, -- Need OR

extendedPHR-r10 ENUMERATED {setup} OPTIONAL -- Need OR

} OPTIONAL -- Need ON

]],

[[ stag-ToReleaseList-r11 STAG-ToReleaseList-r11 OPTIONAL, -- Need ON

stag-ToAddModList-r11 STAG-ToAddModList-r11 OPTIONAL, -- Need ON

drx-Config-v1130 DRX-Config-v1130 OPTIONAL -- Need ON

]],

[[ e-HARQ-Pattern-r12 BOOLEAN OPTIONAL, -- Need ON

dualConnectivityPHR CHOICE {

release NULL,

setup SEQUENCE {

phr-ModeOtherCG-r12 ENUMERATED {real, virtual}

}

} OPTIONAL, -- Need ON

logicalChannelSR-Config-r12 CHOICE {

release NULL,

setup SEQUENCE {

logicalChannelSR-ProhibitTimer-r12 ENUMERATED {sf20, sf40, sf64, sf128, sf512, sf1024, sf2560, spare1}

}

} OPTIONAL -- Need ON

]],

[[ drx-Config-v1310 DRX-Config-v1310 OPTIONAL, -- Need ON

extendedPHR2-r13 BOOLEAN OPTIONAL, -- Need ON

eDRX-Config-CycleStartOffset-r13 CHOICE {

release NULL,

setup

CHOICE {

sf5120 INTEGER(0..1),

sf10240 INTEGER(0..3)

}

} OPTIONAL -- Need ON

]],

[[ drx-Config-r13 CHOICE {

release NULL,

setup DRX-Config-r13

} OPTIONAL -- Need ON

]],

[[ skipUplinkTx-r14 CHOICE {

release NULL,

setup SEQUENCE {

skipUplinkTxSPS-r14 ENUMERATED {true} OPTIONAL, -- Need OR

skipUplinkTxDynamic-r14 ENUMERATED {true} OPTIONAL -- Need OR

}

} OPTIONAL, -- Need ON

dataInactivityTimerConfig-r14 CHOICE {

release NULL,

setup SEQUENCE {

dataInactivityTimer-r14 DataInactivityTimer-r14

}

} OPTIONAL -- Need ON

]],

[[ rai-Activation-r14 ENUMERATED {true} OPTIONAL -- Need OR

]],

[[ shortTTI-AndSPT-r15 CHOICE {

release NULL,

setup SEQUENCE {

drx-Config-r15 DRX-Config-r15 OPTIONAL, -- Need ON

periodicBSR-Timer-r15 ENUMERATED {

sf1, sf5, sf10, sf16, sf20, sf32, sf40,

sf64, sf80, sf128, sf160, sf320, sf640,

sf1280, sf2560, infinity}

OPTIONAL, -- Need ON

proc-Timeline-r15 ENUMERATED {nplus4set1, nplus6set1,

nplus6set2, nplus8set2 } OPTIONAL, -- Need ON

ssr-ProhibitTimer-r15 INTEGER (0..7) OPTIONAL -- Need ON

}

} OPTIONAL, -- Need ON

mpdcch-UL-HARQ-ACK-FeedbackConfig-r15 BOOLEAN OPTIONAL, -- Need ON

dormantStateTimers-r15 CHOICE {

release NULL,

setup SEQUENCE {

sCellHibernationTimer-r15 ENUMERATED {

rf2, rf4, rf8, rf16, rf32, rf64, rf128, spare} OPTIONAL, -- Need OR

dormantSCellDeactivationTimer-r15 ENUMERATED {

rf2, rf4, rf8, rf16, rf32, rf64,

rf128, rf320, rf640, rf1280, rf2560,

rf5120, rf10240, spare3, spare2, spare1} OPTIONAL -- Need OR

}

} OPTIONAL -- Need ON

]],

[[ ce-ETWS-CMAS-RxInConn-r16 ENUMERATED {true} OPTIONAL -- Need OR

]]

}

MAC-MainConfigSCell-r11 ::= SEQUENCE {

stag-Id-r11 STAG-Id-r11 OPTIONAL, -- Need OP

...

}

DRX-Config ::= CHOICE {

release NULL,

setup SEQUENCE {

onDurationTimer ENUMERATED {

psf1, psf2, psf3, psf4, psf5, psf6,

psf8, psf10, psf20, psf30, psf40,

psf50, psf60, psf80, psf100,

psf200},

drx-InactivityTimer ENUMERATED {

psf1, psf2, psf3, psf4, psf5, psf6,

psf8, psf10, psf20, psf30, psf40,

psf50, psf60, psf80, psf100,

psf200, psf300, psf500, psf750,

psf1280, psf1920, psf2560, psf0-v1020,

spare9, spare8, spare7, spare6,

spare5, spare4, spare3, spare2,

spare1},

drx-RetransmissionTimer ENUMERATED {

psf1, psf2, psf4, psf6, psf8, psf16,

psf24, psf33},

longDRX-CycleStartOffset CHOICE {

sf10 INTEGER(0..9),

sf20 INTEGER(0..19),

sf32 INTEGER(0..31),

sf40 INTEGER(0..39),

sf64 INTEGER(0..63),

sf80 INTEGER(0..79),

sf128 INTEGER(0..127),

sf160 INTEGER(0..159),

sf256 INTEGER(0..255),

sf320 INTEGER(0..319),

sf512 INTEGER(0..511),

sf640 INTEGER(0..639),

sf1024 INTEGER(0..1023),

sf1280 INTEGER(0..1279),

sf2048 INTEGER(0..2047),

sf2560 INTEGER(0..2559)

},

shortDRX SEQUENCE {

shortDRX-Cycle ENUMERATED {

sf2, sf5, sf8, sf10, sf16, sf20,

sf32, sf40, sf64, sf80, sf128, sf160,

sf256, sf320, sf512, sf640},

drxShortCycleTimer INTEGER (1..16)

} OPTIONAL -- Need OR

}

}

DRX-Config-v1130 ::= SEQUENCE {

drx-RetransmissionTimer-v1130 ENUMERATED {psf0-v1130} OPTIONAL, --Need OR

longDRX-CycleStartOffset-v1130 CHOICE {

sf60-v1130 INTEGER(0..59),

sf70-v1130 INTEGER(0..69)

} OPTIONAL, --Need OR

shortDRX-Cycle-v1130 ENUMERATED {sf4-v1130} OPTIONAL --Need OR

}

DRX-Config-v1310 ::= SEQUENCE {

longDRX-CycleStartOffset-v1310 SEQUENCE {

sf60-v1310 INTEGER(0..59)

} OPTIONAL --Need OR

}

DRX-Config-r13 ::= SEQUENCE {

onDurationTimer-v1310 ENUMERATED {psf300, psf400, psf500, psf600,

psf800, psf1000, psf1200, psf1600}

OPTIONAL, --Need OR

drx-RetransmissionTimer-v1310 ENUMERATED {psf40, psf64, psf80, psf96, psf112,

psf128, psf160, psf320}

OPTIONAL, --Need OR

drx-ULRetransmissionTimer-r13 ENUMERATED {psf0, psf1, psf2, psf4, psf6, psf8, psf16,

psf24, psf33, psf40, psf64, psf80, psf96,

psf112, psf128, psf160, psf320}

OPTIONAL --Need OR

}

DRX-Config-r15 ::= SEQUENCE {

drx-RetransmissionTimerShortTTI-r15 ENUMERATED {

tti10, tti20, tti40, tti64, tti80, tti96,

tti112,tti128, tti160, tti320} OPTIONAL, --Need OR

drx-UL-RetransmissionTimerShortTTI-r15 ENUMERATED {

tti0, tti1, tti2, tti4, tti6, tti8, tti16,

tti24, tti33, tti40, tti64, tti80, tti96, tti112,

tti128, tti160, tti320} OPTIONAL --Need OR

}

PeriodicBSR-Timer-r12 ::= ENUMERATED {

sf5, sf10, sf16, sf20, sf32, sf40, sf64, sf80,

sf128, sf160, sf320, sf640, sf1280, sf2560,

infinity, spare1}

RetxBSR-Timer-r12 ::= ENUMERATED {

sf320, sf640, sf1280, sf2560, sf5120,

sf10240, spare2, spare1}

STAG-ToReleaseList-r11 ::= SEQUENCE (SIZE (1..maxSTAG-r11)) OF STAG-Id-r11

STAG-ToAddModList-r11 ::= SEQUENCE (SIZE (1..maxSTAG-r11)) OF STAG-ToAddMod-r11

STAG-ToAddMod-r11 ::= SEQUENCE {

stag-Id-r11 STAG-Id-r11,

timeAlignmentTimerSTAG-r11 TimeAlignmentTimer,

...

}

STAG-Id-r11::= INTEGER (1..maxSTAG-r11)

-- ASN1STOP

| *MAC-MainConfig* field descriptions | |
| --- | --- |
| ***ce-ETWS-CMAS-RxInConn***  Indicates UE shall monitor for ETWS/CMAS notification on control channels associated with the shared data channel in RRC\_CONNECTED as specified in TS 36.213 [23], clause 7.1. | | |
| ***dl-PathlossChange***  DL Pathloss Change and the change of the required power backoff due to power management (as allowed by P-MPRc, see TS 36.101 [42]) for PHR reporting in TS 36.321 [6]. Value in dB. Value dB1 corresponds to 1 dB, dB3 corresponds to 3 dB and so on. The same value applies for each serving cell (although the associated functionality is performed independently for each cell). | |
| ***dormantSCellDeactivationTimer***  SCell deactivation timer for UEs supporting dormant state as specified in TS 36.321 [6]. Value in number of radio frames. Value rf4 corresponds to 4 radio frames, value rf8 corresponds to 8 radio frames and so on. E-UTRAN only configures the field if the UE is configured with one or more SCells other than the PSCell and PUCCH SCell. The same value applies for each SCell of a Cell Group (i.e. MCG or SCG) (although the associated functionality is performed independently for each SCell).Field *dormantSCellDeactivationTimer* does not apply for the PUCCH SCell. | |
| ***drx-Config***  Used to configure DRX as specified in TS 36.321 [6]. E-UTRAN configures the values in *DRX-Config-v1130* only if the UE indicates support for IDC indication. E-UTRAN configures *drx-Config-v1130, drx-Config-v1310 and drx-Config-r13* only if *drx-Config* (without suffix) is configured. E-UTRAN configures *drx-Config-r13* only if UE supports CE or if the UE is configured with uplink of an LAA SCell. | |
| ***drx-InactivityTimer***  Timer for DRX in TS 36.321 [6]. Value in number of PDCCH sub-frames. Value psf0 corresponds to 0 PDCCH sub-frame and behaviour as specified in 7.3.2 applies, value psf1 corresponds to 1 PDCCH sub-frame, psf2 corresponds to 2 PDCCH sub-frames and so on. | |
| ***drx-RetransmissionTimer***  Timer for DRX in TS 36.321 [6]. Value in number of PDCCH sub-frames. Value psf0 corresponds to 0 PDCCH sub-frame and behaviour as specified in 7.3.2 applies, value psf1 corresponds to 1 PDCCH sub-frame, psf2 corresponds to 2 PDCCH sub-frames and so on. In case *drx-RetransmissionTimer-v1130* or *drx-RetransmissionTimer-v1310* is signalled, the UE shall ignore *drx-RetransmissionTimer* (i.e. without suffix). | |
| ***drx-RetransmissionTimerShortTTI***  Timer for DRX in TS 36.321 [6]. Value in number of short TTIs when short TTI is configured. Value *tti10* corresponds to 10 TTIs, value *tti20* corresponds to 20 TTIs and so on. | |
| ***drx-ULRetransmissionTimer***  Timer for DRX in TS 36.321 [6]. Value in number of PDCCH sub-frames. Value psf0 correponds to 0 PDCCH sub-frame and behaviour as specified in 7.3.2 applies, value psf1 corresponds to 1 PDCCH sub-frame, psf2 corresponds to 2 PDCCH sub-frames and so on. | |
| ***drx-UL-RetransmissionTimerShortTTI***  Timer for DRX in TS 36.321 [6]. Value in number of short TTIs when short TTI is configured. Value *tti0* corresponds to 0 TTIs and behaviour as specified in 7.3.2 applies, value *tti1* corresponds to 1 TTI and so on. | |
| ***drxShortCycleTimer***  Timer for DRX in TS 36.321 [6]. Value in multiples of shortDRX-Cycle. A value of 1 corresponds to shortDRX-Cycle, a value of 2 corresponds to 2 \* shortDRX-Cycle and so on. | |
| ***dualConnectivityPHR***  Indicates if power headroom shall be reported using Dual Connectivity Power Headroom Report MAC Control Element defined in TS 36.321 [6] (value *setup*). For both LTE DC and (NG)EN-DC, if PHR functionality is configured, E-UTRAN always configures the value *setup* for this field andconfigures *phr-Config* and *dualConnectivityPHR*. For LTE DC, E-UTRAN configures the field for both CGs while for (NG)EN-DC, E-UTRAN configures the field only for MCG. | |
| ***e-HARQ-Pattern***  TRUE indicates that enhanced HARQ pattern for TTI bundling is enabled for FDD. E-UTRAN enables this field only when *ttiBundling* is set to *TRUE.* | |
| ***eDRX-Config-CycleStartOffset***  Indicates *longDRX-Cycle* and *drxStartOffset* in TS 36.321 [6]. The value of *longDRX-Cycle* is in number of sub-frames. The value of *drxStartOffset*, in number of subframes, is indicated by the value of *eDRX-Config-CycleStartOffset* multiplied by 2560 plus the offset value configured in *longDRX-CycleStartOffset*. E-UTRAN only configures value *setup* when the value in *longDRX-CycleStartOffset* is sf2560. | |
| ***extendedBSR-Sizes***  If value *setup* is configured, the BSR index indicates extended BSR size levels as defined in TS 36.321 [6], Table 6.1.3.1-2. | |
| ***extendedPHR***  Indicates if power headroom shall be reported using the Extended Power Headroom Report MAC control element defined in TS 36.321 [6] (value *setup*). E-UTRAN always configures the value *setup* if more than one and up to eight Serving Cell(s) with uplink is configured and none of the serving cells with uplink configured has a *servingCellIndex* higher than seven and if PUCCH on SCell is not configured and if dual connectivity is not configured. E-UTRAN configures *extendedPHR* only if *phr-Config* is configured. The UE shall release *extendedPHR* if *phr-Config* is released. | |
| ***extendedPHR2***  Indicates if power headroom shall be reported using the Extended Power Headeroom Report MAC Control Element defined in TS 36.321 [6] (value *setup*). E-UTRAN always configures the value *setup* if any of the serving cells with uplink configured has a *servingCellIndex* higher than seven in case dual connectivity is not configured or if PUCCH SCell (with any number of serving cells with uplink configured) is configured. E-UTRAN configures *extendedPHR2* only if *phr-Config* is configured. The UE shall release *extendedPHR2* if *phr-Config* is released. | |
| ***logicalChannelSR-ProhibitTimer***  Timerused to delay the transmission of an SR for logical channels enabled by *logicalChannelSR-Prohibit.* Value sf20 corresponds to 20 subframes, sf40 corresponds to 40 subframes, and so on. See TS 36.321 [6]. | |
| ***longDRX-CycleStartOffset***  *longDRX-Cycle* and *drxStartOffset* in TS 36.321 [6] unless *eDRX-Config-CycleStartOffse*t is configured. The value of l*ongDRX-Cycle* is in number of sub-frames. Value sf10 corresponds to 10 sub-frames, sf20 corresponds to 20 sub-frames and so on. If *shortDRX-Cycle* is configured, the value of *longDRX-Cycle* shall be a multiple of the *shortDRX-Cycle* value. The value of *drxStartOffset* value is in number of sub-frames. In case *longDRX-CycleStartOffset-v1130* is signalled, the UE shall ignore *longDRX-CycleStartOffset* (i.e. without suffix). In case *longDRX-CycleStartOffset-v1310* is signalled, the UE shall ignore *longDRX-CycleStartOffset* (i.e. without suffix). | |
| ***maxHARQ-Tx***  Maximum number of transmissions for UL HARQ in TS 36.321 [6]. | |
| ***mpdcch-UL-HARQ-ACK-FeedbackConfig***  TRUE indicates E-UTRAN may send UL HARQ-ACK feedback or UL grant corresponding to a new transmission for early termination of PUSCH transmission, or positive acknowledgement of completed PUSCH transmissions as specified in TS 36.321 [6] and TS 36.212 [22]. In case of acknowledgement of RRC Connection Release, MPDCCH monitoring is terminated. |
| ***onDurationTimer***  Timer for DRX in TS 36.321 [6]. Value in number of PDCCH sub-frames. Value psf1 corresponds to 1 PDCCH sub-frame, psf2 corresponds to 2 PDCCH sub-frames and so on. In case *onDurationTimer-v1310* is signalled, the UE shall ignore *onDurationTimer* (i.e. without suffix). | |
| ***periodicBSR-Timer***  Timer for BSR reporting in TS 36.321 [6]. Value in number of sub-frames. Value sf10 corresponds to 10 sub-frames, sf20 corresponds to 20 sub-frames and so on. | |
| ***periodicPHR-Timer***  Timer for PHR reporting in TS 36.321 [6]. Value in number of sub-frames. Value sf10 corresponds to 10 subframes, sf20 corresponds to 20 subframes and so on. | |
| ***phr-ModeOtherCG***  Indicates the mode (i.e. *real* or *virtual)* used for the PHR of the activated cells that are part of the other Cell Group (i.e. MCG or SCG), when DC is configured. | |
| ***proc-Timeline***  Minimum processing timeline for short TTI with subslot operation. Value nplus4set1 indicates processing time n+4 for set 1, value nplus6set1 indicates processing time n+6 for set 1, value nplus6set2 indicates processing time n+6 for set and value nplus8set2 indicates processing time n+8 for set 2. See also UE capability *min-Proc-TimelineSubslot* for sTTI. | |
| ***prohibitPHR-Timer***  Timer for PHR reporting in TS 36.321 [6]. Value in number of sub-frames. Value sf0 corresponds to 0 subframes and behaviour as specified in 7.3.2 applies, sf100 corresponds to 100 subframes and so on. | |
| ***rai-Activation***  Activation of release assistance indication (RAI) in TS 36.321 [6] for BL UEs. | |
| ***retxBSR-Timer***  Timer for BSR reporting in TS 36.321 [6]. Value in number of sub-frames. Value sf640 corresponds to 640 sub-frames, sf1280 corresponds to 1280 sub-frames and so on. | |
| ***sCellDeactivationTimer***  SCell deactivation timer in TS 36.321 [6]. Value in number of radio frames. Value rf4 corresponds to 4 radio frames, value rf8 corresponds to 8 radio frames and so on. E-UTRAN only configures the field if the UE is configured with one or more SCells other than the PSCell and PUCCH SCell. If the field is absent, the UE shall delete any existing value for this field and assume the value to be set to *infinity*. The same value applies for each SCell of a Cell Group (i.e. MCG or SCG) (although the associated functionality is performed independently for each SCell).Field *sCellDeactivationTimer* does not apply for the PUCCH SCell. | |
| ***sCellHibernationTimer***  SCell hibernation timer for UEs supporting dormant SCell state as specified in TS 36.321 [6]. Value in number of radio frames. Value rf4 corresponds to 4 radio frames, value rf8 corresponds to 8 radio frames and so on. E-UTRAN only configures the field if the UE is configured with one or more SCells other than the PSCell and PUCCH SCell. The same value applies for each SCell of a Cell Group (i.e. MCG or SCG) (although the associated functionality is performed independently for each SCell).Field *sCellHibernationTimer* does not apply for the PUCCH SCell. | |
| ***shortDRX-Cycle***  Short DRX cyclein TS 36.321 [6]. Value in number of sub-frames. Value sf2 corresponds to 2 sub-frames, sf5 corresponds to 5 subframes and so on. In case *shortDRX-Cycle-v1130* is signalled, the UE shall ignore *shortDRX-Cycle* (i.e. without suffix). Short DRX cycle is not configured for UEs in CE. | |
| ***skipUplinkTxDynamic***  If configured, the UE skips UL transmissions for an uplink grant other than a configured uplink grant if no data is available for transmission in the UE buffer as described in TS 36.321 [6]. | |
| ***skipUplinkTxSPS***  If configured, the UE skips UL transmissions for a configured uplink grant if no data is available for transmission in the UE buffer as described in TS 36.321 [6]. E-UTRAN always configures *skipUplinkTxSPS* when there is at least one SPS configuration with *semiPersistSchedIntervalUL* shorter than sf10 or when at least one SPS-ConfigUL-STTI is configured for the cell group. | |
| ***sr-ProhibitTimer***  Timer for SR transmission on PUCCH in TS 36.321 [6]. Value in number of SR period(s) of shortest SR period of any serving cell with PUCCH. Value 0 means that behaviour as specified in 7.3.2 applies. Value 1 corresponds to one SR period, Value 2 corresponds to 2\*SR periods and so on. SR period is defined in TS 36.213 [23], table 10.1.5-1. | |
| ***ssr-ProhibitTimer***  Timer for prohibiting SR transmission on SPUCCH in TS 36.321 [6]. Value in number of SR period(s) of shortest SR period of any serving cell with SPUCCH. Value 0 means that behaviour as specified in 7.3.2 applies. Value 1 corresponds to one SR period, value 2 corresponds to 2 SR periods and so on. SR period is defined in TS 36.213 [23], table 10.1.5-1. | |
| ***stag-Id***  Indicates the TAG of an SCell, see TS 36.321 [6]. Uniquely identifies the TAG within the scope of a Cell Group (i.e. MCG or SCG). If the field is not configured for an SCell (e.g. absent in *MAC-MainConfigSCell*), the SCell is part of the PTAG. | |
| ***stag-ToAddModList, stag-ToReleaseList***  Used to configure one or more STAGs. E-UTRAN ensures that a STAG contains at least one SCell with configured uplink. If, due to SCell release a reconfiguration would result in an 'empty' TAG, E-UTRAN includes release of the concerned TAG. | |
| ***timeAlignmentTimerSTAG***  Indicates the value of the time alignment timer for an STAG, see TS 36.321 [6]. | |
| ***ttiBundling***  TRUE indicates that TTI bundling TS 36.321 [6] is enabled while FALSE indicates that TTI bundling is disabled. TTI bundling can be enabled for FDD and for TDD for configurations 0, 1 and 6 and additionally for configurations 2 and 3 when *symPUSCH-UpPTS-r14* is configured. The functionality is performed independently per Cell Group (i.e. MCG or SCG), but E-UTRAN does not configure TTI bundling for the SCG. For a TDD PCell, E-UTRAN does not simultaneously enable TTI bundling and semi-persistent scheduling in this release of specification. Furthermore, for a Cell Group, E-UTRAN does not simultaneously configure TTI bundling and SCells with configured uplink, and E-UTRAN does not simultaneously configure TTI bundling and eIMTA. | |

<<unchanged text skipped>>

#### – *ResourceReservationConfig*

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

*ResourceReservationConfig* information element

-- ASN1START

ResourceReservationConfigDL-r16 ::= SEQUENCE {

periodicityStartPos-r16 PeriodicityStartPos-r16,

resourceReservationFreq-r16 CHOICE {

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

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

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

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

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

rbg-Bitmap20 BIT STRING (SIZE (25))

},

slotBitmap-r16 CHOICE {

slotPattern10ms BIT STRING (SIZE (20)),

slotPattern40ms BIT STRING (SIZE (80))

},

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

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

}

ResourceReservationConfigUL-r16 ::= SEQUENCE {

periodicityStartPos-r16 PeriodicityStartPos-r16,

slotBitmap-r16 CHOICE {

slotPattern10ms BIT STRING (SIZE (20)),

slotPattern40ms BIT STRING (SIZE (80))

} OPTIONAL, -- Cond FDDandTDDnoDL

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

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

...

}

PeriodicityStartPos-r16 ::= CHOICE {

periodicity10ms NULL,

periodicity20ms INTEGER(0..1),

periodicity40ms INTEGER(0..3),

periodicity80ms INTEGER(0..7),

periodicity160ms INTEGER(0..15)

}

-- ASN1STOP

| *ResourceReservationConfig* field descriptions |
| --- |
| ***periodicityStartPos***  Indicates periodicity and start offset of of the reserved resources. Value set to *periodicity10ms* corresponds to periodicity 10 milliseconds and corresponding start position is 0, value set to *periodicity20ms* corresponds to periodicity 20 milliseconds and corresponding start position in milliseconds = indicated value \* 10ms, and so on. |
| ***resourceReservationFreq***  Downlink frequency domain resource reservation bitmap where each bit corresponds to a resource block group (RBG), see TS 36.213 [23]. Value *rbg-Bitmap1dot4* corresponds to 1.4 MHz system bandwidth, value *rbg-Bitmap3* corresponds to 3 MHz system bandwidth, and so on. |
| ***slotBitmap***  Slot-level resource reservation configuration. Value *slotPattern10ms* corresponds to 10ms slot pattern and *slotPattern40ms* corresponds to 40ms slot pattern, see TS 36.213 [23] for DL and TS 36.211 [21] for UL.  The first/leftmost 2-bits corresponds to the subframe #0 of the radio frame satisfying SFN mod periodicity = start position, as indicated by *periopdicityStartPos*. Two bits for each subframe coded as:  00: both slots are not reserved  01: the first slot is not reserved, the second slot is reserved  10: the first slot is reserved, the second slot is not reserved  11: both slots are reserved. |
| ***symbolBitmap1, symbolBitmap2***  Provides the symbol-level resource reservation for one subframe. If *symbolBitmap1* is absent, value '01' in the *slotBitmap* corresponds to the whole 2nd slot being reserved. If *symbolBitmap2* is absent, value '10' in the *slotBitmap* corresponds to the whole 1st slot being reserved. |

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

<<unchanged text skipped>>

#### – *PDSCH-Config*

The IE *PDSCH-ConfigCommon* and the IE *PDSCH-ConfigDedicated* are used to specify the common and the UE specific PDSCH configuration respectively.

*PDSCH-Config* information element

-- ASN1START

PDSCH-ConfigCommon ::= SEQUENCE {

referenceSignalPower INTEGER (-60..50),

p-b INTEGER (0..3)

}

PDSCH-ConfigCommon-v1310 ::= SEQUENCE {

pdsch-maxNumRepetitionCEmodeA-r13 ENUMERATED {

r16, r32 } OPTIONAL, -- Need OR

pdsch-maxNumRepetitionCEmodeB-r13 ENUMERATED {

r192, r256, r384, r512, r768, r1024,

r1536, r2048} OPTIONAL -- Need OR

}

PDSCH-ConfigDedicated::= SEQUENCE {

p-a ENUMERATED {

dB-6, dB-4dot77, dB-3, dB-1dot77,

dB0, dB1, dB2, dB3}

}

PDSCH-ConfigDedicated-v1130 ::= SEQUENCE {

dmrs-ConfigPDSCH-r11 DMRS-Config-r11 OPTIONAL, -- Need ON

qcl-Operation ENUMERATED {typeA, typeB} OPTIONAL, -- Need OR

re-MappingQCLConfigToReleaseList-r11 RE-MappingQCLConfigToReleaseList-r11 OPTIONAL, -- Need ON

re-MappingQCLConfigToAddModList-r11 RE-MappingQCLConfigToAddModList-r11 OPTIONAL -- Need ON

}

PDSCH-ConfigDedicated-v1280 ::= SEQUENCE {

tbsIndexAlt-r12 ENUMERATED {a26, a33} OPTIONAL -- Need OR

}

PDSCH-ConfigDedicated-v1310 ::= SEQUENCE {

dmrs-ConfigPDSCH-v1310 DMRS-Config-v1310 OPTIONAL -- Need ON

}

PDSCH-ConfigDedicated-v1430 ::= SEQUENCE {

ce-PDSCH-MaxBandwidth-r14 ENUMERATED {bw5, bw20} OPTIONAL, -- Need OP

ce-PDSCH-TenProcesses-r14 ENUMERATED {on} OPTIONAL, -- Need OR

ce-HARQ-AckBundling-r14 ENUMERATED {on} OPTIONAL, -- Need OR

ce-SchedulingEnhancement-r14 ENUMERATED {range1, range2} OPTIONAL, -- Need OR

tbsIndexAlt2-r14 ENUMERATED {b33} OPTIONAL -- Need OR

}

PDSCH-ConfigDedicated-v1530 ::= SEQUENCE {

qcl-Operation-v1530 ENUMERATED {typeC} OPTIONAL, -- Need OR

tbs-IndexAlt3-r15 ENUMERATED {a37} OPTIONAL, -- Need OR

-- eNote (ToDo): Clarify that eMTC fields (i.e. fields starting with ce-) do not apply

-- for SCell (merging issue)

ce-CQI-AlternativeTableConfig-r15 ENUMERATED {on} OPTIONAL, -- Need OR

ce-PDSCH-64QAM-Config-r15 ENUMERATED {on} OPTIONAL, -- Need OR

ce-PDSCH-FlexibleStartPRB-AllocConfig-r15 ENUMERATED {on} OPTIONAL, -- Need OR

altMCS-TableScalingConfig-r15 ENUMERATED {oDot5, oDot625, oDot75, oDot875} OPTIONAL -- Need OR

}

PDSCH-ConfigDedicated-v16xy ::= SEQUENCE {

ce-PDSCH-MultiTB-Config-r16 SetupRelease {CE-PDSCH-MultiTB-Config-r16}

}

PDSCH-ConfigDedicatedSCell-v1430 ::= SEQUENCE {

tbsIndexAlt2-r14 ENUMERATED {b33} OPTIONAL -- Need OR

}

CE-PDSCH-MultiTB-Config-r16 ::= SEQUENCE {

interleaving-r16 ENUMERATED {on} OPTIONAL, -- Need OR

harq-Bundling-r16 ENUMERATED {on} OPTIONAL -- Need OR

}

RE-MappingQCLConfigToAddModList-r11 ::= SEQUENCE (SIZE (1..maxRE-MapQCL-r11)) OF PDSCH-RE-MappingQCL-Config-r11

RE-MappingQCLConfigToReleaseList-r11 ::= SEQUENCE (SIZE (1..maxRE-MapQCL-r11)) OF PDSCH-RE-MappingQCL-ConfigId-r11

PDSCH-RE-MappingQCL-Config-r11 ::= SEQUENCE {

pdsch-RE-MappingQCL-ConfigId-r11 PDSCH-RE-MappingQCL-ConfigId-r11,

optionalSetOfFields-r11 SEQUENCE {

crs-PortsCount-r11 ENUMERATED {n1, n2, n4, spare1},

crs-FreqShift-r11 INTEGER (0..5),

mbsfn-SubframeConfigList-r11 CHOICE {

release NULL,

setup SEQUENCE {

subframeConfigList MBSFN-SubframeConfigList

}

} OPTIONAL, -- Need ON

pdsch-Start-r11 ENUMERATED {reserved, n1, n2, n3, n4, assigned}

} OPTIONAL, -- Need OP

csi-RS-ConfigZPId-r11 CSI-RS-ConfigZPId-r11,

qcl-CSI-RS-ConfigNZPId-r11 CSI-RS-ConfigNZPId-r11 OPTIONAL, -- Need OR

...,

[[ mbsfn-SubframeConfigList-v1430 CHOICE {

release NULL,

setup SEQUENCE {

subframeConfigList-v1430 MBSFN-SubframeConfigList-v1430

}

} OPTIONAL -- Need OP

]],

[[ codewordOneConfig-v1530 CHOICE {

release NULL,

setup SEQUENCE {

crs-PortsCount-v1530 ENUMERATED {n1, n2, n4, spare1},

crs-FreqShift-v1530 INTEGER (0..5),

mbsfn-SubframeConfigList-v1530 MBSFN-SubframeConfigList OPTIONAL,

mbsfn-SubframeConfigListExt-v1530 MBSFN-SubframeConfigList-v1430 OPTIONAL,

pdsch-Start-v1530 ENUMERATED {reserved, n1, n2, n3, n4, assigned},

csi-RS-ConfigZPId-v1530 CSI-RS-ConfigZPId-r11,

qcl-CSI-RS-ConfigNZPId-v1530 CSI-RS-ConfigNZPId-r11 OPTIONAL

}

} OPTIONAL -- Cond TypeC

]]

}

-- ASN1STOP

| *PDSCH-Config* field descriptions |
| --- |
| ***altMCS-TableScalingConfig***  Presence of the field indicates activation of 6-bit MCS table (i.e., *altMCS-Table*) for UE indicating support for *altMCS-Table*, see TS 36.212 [22] and TS 36.213 [23]. The indicated value configures the parameter *altMCS-Table-Scaling* where value oDot5 corresponds to scaling factor 0.5, value oDot625 corresponds to scaling factor 0.625 and so on, see TS 36.213 [23]. |
| ***ce-CQI-AlternativeTableConfig***  Configures the UE supporting alternative CQI table to use the alternative CQI table in CE mode A. See TS 36.213 [23]. |
| ***ce-HARQ-AckBundling***  Activation of PDSCH HARQ-ACK bundling in half duplex FDD in CE mode A, see TS 36.212 [22] and TS 36.213 [23]. |
| ***ce-PDSCH-64QAM-Config***  Activation of 64 QAM for non-repeated unicast PDSCH in CE mode A. |
| ***ce-PDSCH-FlexibleStartPRB-AllocConfig***  Activation of flexible starting PRB for PDSCH resource allocation in CE mode A or B. E-UTRAN does not configure this field when E-UTRA system bandwidth is 1.4 MHz. |
| ***ce-PDSCH-MaxBandwidth***  Maximum PDSCH channel bandwidth in CE mode A and B, see TS 36.212 [22] and TS 36.213 [23]. Value bw5 corresponds to 5 MHz, and value bw20 corresponds to 20 MHz. If this field is absent, the UE shall release any existing value and set the maximum PDSCH channel bandwidth in CE mode A and B to 1.4 MHz. Parameter: transmission bandwidth configuration, see TS 36.101 [42], table 5.6-1. The max bandwidth can by configured to 5MHz for BL UEs and 5MHz or 20MHz for UEs in CE. |
| ***ce-PDSCH-MultiTB-Config***  Indicates whether DL multi-TB scheduling is enabled, i.e., a single DCI can schedule up to 8 PDSCH transport blocks in CE mode A and up to 4 PDSCH transport blocks in CE mode B. See TS 36.213 [23], clause 7.1.11. | |
|  | |
|  | |
| ***ce-PDSCH-TenProcesses***  Configuration of 10 (instead of 8) DL HARQ processes in FDD in CE mode A, see TS 36.212 [22] and TS 36.213 [23]. |
| ***ce-SchedulingEnhancement***  Activation of dynamic HARQ-ACK delay for HD-FDD for PDSCH in CE mode A controlled by the DCI, see TS 36.212 [22] and TS 36.213 [23]. Value range1 corresponds to the first range of HARQ-ACK delays, and value range2 corresponds to second range of HARQ-ACK delays. |
| ***codewordOneConfig***  The field corresponds to codeword 1, see TS 36.213 [23], clause 7.1.10. If absent, the UE applies the values from the serving cell configured on the same frequency. |
| ***harq*** | |
| ***i*** | |
| ***mbsfn-SubframeConfigList***  Indicates the MBSFN configuration for the CSI-RS resources. If *optionalSetOfFields* is absent, the fields *mbsfn-SubframeConfigList-r11* and *mbsfn-SubframeConfigList-v1430* are released. |
| ***optionalSetOfFields***  If absent, the UE releases the configuration provided previously, if any, and applies the values from the serving cell configured on the same frequency. If the UE is configured with *qcl-Operation-v1530*, this field corresponds to codeword 0, see TS 36.213 [23], clause 7.1.10. |
| ***p-a***  Parameter: , see TS 36.213 [23], clause 5.2. Value dB-6 corresponds to -6 dB, dB-4dot77 corresponds to -4.77 dB etc. |
| ***p-b***  Parameter: , see TS 36.213 [23], clause Table 5.2-1. |
| ***pdsch-maxNumRepetitionCEmodeA***  Maximum value to indicate the set of PDSCH repetition numbers for CE mode A, see TS 36.211 [21] and TS 36.213 [23]. |
| ***pdsch-maxNumRepetitionCEmodeB***  Maximum value to indicate the set of PDSCH repetition numbers for CE mode B, see TS 36.211 [21] and TS 36.213 [23]. |
| ***pdsch-Start***  The starting OFDM symbol of PDSCH for the concerned serving cell, see TS 36.213 [23], clause 7.1.6.4. Values 1, 2, 3 are applicable when *dl-Bandwidth* for the concerned serving cell is greater than 10 resource blocks, values 2, 3, 4 are applicable when *dl-Bandwidth* for the concerned serving cell is less than or equal to 10 resource blocks, see TS 36.211 [21], Table 6.7-1. Value *n1* corresponds to 1, value *n2* corresponds to 2 and so on. If the field *pdsch-Start-v1530* is also configured, E-UTRAN ensures that this value is the same as *pdsch-Start* (i.e., without suffix)*.* |
| ***qcl-CSI-RS-ConfigNZPId***  Indicates the CSI-RS resource that is quasi co-located with the PDSCH antenna ports, see TS 36.213 [23], clause 7.1.9. E-UTRAN configures this field if and only if the UE is configured with *qcl-Operation* set to *typeB* or *qcl-Operation-v1530* set to *typeC*. If the UE is configured with *qcl-Operation-v1530* set to *typeC*, the field *qcl-CSI-RS-ConfigNZPId-r11* corresponds to codeword 0, and the field *qcl-CSI-RS-ConfigNZPId-v1530* corresponds to codeword 1, see TS 36.213 [23], clause 7.1.10.. |
| ***qcl-Operation***  Indicates the quasi co-location behaviour to be used by the UE, type A, type B, or type C, as described in TS 36.213 [23], clause 7.1.10. In case *qcl-Operation-v1530* is present, the UE shall ignore the field qcl-Operation (without suffix). E-UTRAN configures *qcl-Operation-v1530* only when transmission mode 10 is configured for the serving cell on this carrier frequency and QCL type C is configured. |
| ***referenceSignalPower***  Parameter: *Reference-signal power*, which provides the downlink reference-signal EPRE,see TS 36.213 [23], clause 5.2. The actual value in dBm. |
| ***re-MappingQCLConfigToAddModList, re-MappingQCLConfigToReleaseList***  For a serving frequency E-UTRAN configures at least one *PDSCH-RE-MappingQCL-Config* when transmission mode 10 is configured for the serving cell on this carrier frequency. Otherwise it does not configure this field. |
| ***tbsIndexAlt***  Indicates the applicability of the alternative TBS index for the ITBS 26 and 33 (see TS 36.213 [23], Table 7.1.7.2.1-1), to all subframes scheduled by DCI format 2C or 2D. Value a26 refers to the alternative TBS index ITBS 26A, and value a33 refers to the alternative TBS index ITBS 33A. If this field is not configured, the UE shall use ITBS 26 specified in Table 7.1.7.2.1-1 in TS 36.213 [23] for all subframes instead. If neither this field nor tbsIndexAlt2 configures an alternative TBS index for ITBS 33, the UE shall use ITBS 33 specified in Table 7.1.7.2.1-1 in TS 36.213 [23] for all subframes instead. |
| ***tbsIndexAlt2***  Indicates the applicability of the alternative TBS index for the *I*TBS 33 (see TS 36.213 [23], Table 7.1.7.2.1-1) to all subframes. Value *b33* refers to the alternative TBS index *I*TBS 33B. If neither this field nor *tbsIndexAlt* configures an alternative TBS index for *I*TBS 33, the UE shall use *I*TBS 33 specified in Table 7.1.7.2.1-1 in TS 36.213 [23] for all subframes instead. |
| ***tbs-IndexAlt3***  Indicates the applicability of the alternative TBS index for the *I*TBS 37 (see TS 36.213 [23], Table 7.1.7.2.1-1) to all subframes. Value a37 refers to the alternative TBS index *I*TBS 37A. |

| Conditional presence | Explanation |
| --- | --- |
| *TypeC* | The field is optional, need ON when *qcl-Operation* is configured with *typeC*. Otherwise the field is not present and the UE shall delete any existing value for this field. |

#### – *PhysicalConfigDedicated*

The IE *PhysicalConfigDedicated* is used to specify the UE specific physical channel configuration.

*PhysicalConfigDedicated* information element

-- ASN1START

PhysicalConfigDedicated ::= SEQUENCE {

pdsch-ConfigDedicated PDSCH-ConfigDedicated OPTIONAL, -- Need ON

pucch-ConfigDedicated PUCCH-ConfigDedicated OPTIONAL, -- Need ON

pusch-ConfigDedicated PUSCH-ConfigDedicated OPTIONAL, -- Need ON

uplinkPowerControlDedicated UplinkPowerControlDedicated OPTIONAL, -- Need ON

tpc-PDCCH-ConfigPUCCH TPC-PDCCH-Config OPTIONAL, -- Need ON

tpc-PDCCH-ConfigPUSCH TPC-PDCCH-Config OPTIONAL, -- Need ON

cqi-ReportConfig CQI-ReportConfig OPTIONAL, -- Cond CQI-r8

soundingRS-UL-ConfigDedicated SoundingRS-UL-ConfigDedicated OPTIONAL, -- Need ON

antennaInfo CHOICE {

explicitValue AntennaInfoDedicated,

defaultValue NULL

} OPTIONAL, -- Cond AI-r8

schedulingRequestConfig SchedulingRequestConfig OPTIONAL, -- Need ON

...,

[[ cqi-ReportConfig-v920 CQI-ReportConfig-v920 OPTIONAL, -- Cond CQI-r8

antennaInfo-v920 AntennaInfoDedicated-v920 OPTIONAL -- Cond AI-r8

]],

[[ antennaInfo-r10 CHOICE {

explicitValue-r10 AntennaInfoDedicated-r10,

defaultValue NULL

} OPTIONAL, -- Cond AI-r10

antennaInfoUL-r10 AntennaInfoUL-r10 OPTIONAL, -- Need ON

cif-Presence-r10 BOOLEAN OPTIONAL, -- Need ON

cqi-ReportConfig-r10 CQI-ReportConfig-r10 OPTIONAL, -- Cond CQI-r10

csi-RS-Config-r10 CSI-RS-Config-r10 OPTIONAL, -- Need ON

pucch-ConfigDedicated-v1020 PUCCH-ConfigDedicated-v1020 OPTIONAL, -- Need ON

pusch-ConfigDedicated-v1020 PUSCH-ConfigDedicated-v1020 OPTIONAL, -- Need ON

schedulingRequestConfig-v1020 SchedulingRequestConfig-v1020 OPTIONAL, -- Need ON

soundingRS-UL-ConfigDedicated-v1020

SoundingRS-UL-ConfigDedicated-v1020 OPTIONAL, -- Need ON

soundingRS-UL-ConfigDedicatedAperiodic-r10

SoundingRS-UL-ConfigDedicatedAperiodic-r10 OPTIONAL, -- Need ON

uplinkPowerControlDedicated-v1020

UplinkPowerControlDedicated-v1020 OPTIONAL -- Need ON

]],

[[ additionalSpectrumEmissionCA-r10 CHOICE {

release NULL,

setup SEQUENCE {

additionalSpectrumEmissionPCell-r10 AdditionalSpectrumEmission

}

} OPTIONAL -- Need ON

]],

[[ -- DL configuration as well as configuration applicable for DL and UL

csi-RS-ConfigNZPToReleaseList-r11

CSI-RS-ConfigNZPToReleaseList-r11 OPTIONAL, -- Need ON

csi-RS-ConfigNZPToAddModList-r11

CSI-RS-ConfigNZPToAddModList-r11 OPTIONAL, -- Need ON

csi-RS-ConfigZPToReleaseList-r11

CSI-RS-ConfigZPToReleaseList-r11 OPTIONAL, -- Need ON

csi-RS-ConfigZPToAddModList-r11 CSI-RS-ConfigZPToAddModList-r11 OPTIONAL, -- Need ON

epdcch-Config-r11 EPDCCH-Config-r11 OPTIONAL, -- Need ON

pdsch-ConfigDedicated-v1130 PDSCH-ConfigDedicated-v1130 OPTIONAL, -- Need ON

-- UL configuration

cqi-ReportConfig-v1130 CQI-ReportConfig-v1130 OPTIONAL, -- Need ON

pucch-ConfigDedicated-v1130 PUCCH-ConfigDedicated-v1130 OPTIONAL, -- Need ON

pusch-ConfigDedicated-v1130 PUSCH-ConfigDedicated-v1130 OPTIONAL, -- Need ON

uplinkPowerControlDedicated-v1130

UplinkPowerControlDedicated-v1130 OPTIONAL -- Need ON

]],

[[ antennaInfo-v1250 AntennaInfoDedicated-v1250 OPTIONAL, -- Cond AI-r10

eimta-MainConfig-r12 EIMTA-MainConfig-r12 OPTIONAL, -- Need ON

eimta-MainConfigPCell-r12 EIMTA-MainConfigServCell-r12 OPTIONAL, -- Need ON

pucch-ConfigDedicated-v1250 PUCCH-ConfigDedicated-v1250 OPTIONAL, -- Need ON

cqi-ReportConfigPCell-v1250 CQI-ReportConfig-v1250 OPTIONAL, -- Need ON

uplinkPowerControlDedicated-v1250

UplinkPowerControlDedicated-v1250 OPTIONAL, -- Need ON

pusch-ConfigDedicated-v1250 PUSCH-ConfigDedicated-v1250 OPTIONAL, -- Need ON

csi-RS-Config-v1250 CSI-RS-Config-v1250 OPTIONAL -- Need ON

]],

[[ pdsch-ConfigDedicated-v1280 PDSCH-ConfigDedicated-v1280 OPTIONAL -- Need ON

]],

[[ pdsch-ConfigDedicated-v1310 PDSCH-ConfigDedicated-v1310 OPTIONAL, -- Need ON

pucch-ConfigDedicated-r13 PUCCH-ConfigDedicated-r13 OPTIONAL, -- Need ON

pusch-ConfigDedicated-r13 PUSCH-ConfigDedicated-r13 OPTIONAL, -- Need ON

pdcch-CandidateReductions-r13

PDCCH-CandidateReductions-r13 OPTIONAL, -- Need ON

cqi-ReportConfig-v1310 CQI-ReportConfig-v1310 OPTIONAL, -- Need ON

soundingRS-UL-ConfigDedicated-v1310

SoundingRS-UL-ConfigDedicated-v1310 OPTIONAL, -- Need ON

soundingRS-UL-ConfigDedicatedUpPTsExt-r13

SoundingRS-UL-ConfigDedicatedUpPTsExt-r13 OPTIONAL, -- Need ON

soundingRS-UL-ConfigDedicatedAperiodic-v1310

SoundingRS-UL-ConfigDedicatedAperiodic-v1310 OPTIONAL, -- Need ON

soundingRS-UL-ConfigDedicatedAperiodicUpPTsExt-r13

SoundingRS-UL-ConfigDedicatedAperiodicUpPTsExt-r13 OPTIONAL, -- Need ON

csi-RS-Config-v1310 CSI-RS-Config-v1310 OPTIONAL, -- Need ON

ce-Mode-r13 CHOICE {

release NULL,

setup ENUMERATED {ce-ModeA,ce-ModeB}

} OPTIONAL, -- Need ON

csi-RS-ConfigNZPToAddModListExt-r13 CSI-RS-ConfigNZPToAddModListExt-r13 OPTIONAL, -- Need ON

csi-RS-ConfigNZPToReleaseListExt-r13 CSI-RS-ConfigNZPToReleaseListExt-r13 OPTIONAL -- Need ON

]],

[[ cqi-ReportConfig-v1320 CQI-ReportConfig-v1320 OPTIONAL -- Need ON

]],

[[ typeA-SRS-TPC-PDCCH-Group-r14 CHOICE {

release NULL,

setup SEQUENCE (SIZE (1..32)) OF SRS-TPC-PDCCH-Config-r14

} OPTIONAL, -- Need ON

must-Config-r14 CHOICE{

release NULL,

setup SEQUENCE {

k-max-r14 ENUMERATED {l1, l3},

p-a-must-r14 ENUMERATED {

dB-6, dB-4dot77, dB-3, dB-1dot77,

dB0, dB1, dB2, dB3} OPTIONAL -- Need ON

}

} OPTIONAL, -- Need ON

pusch-EnhancementsConfig-r14 PUSCH-EnhancementsConfig-r14 OPTIONAL, -- Need ON

ce-pdsch-pusch-EnhancementConfig-r14 ENUMERATED {on} OPTIONAL, -- Need OR

antennaInfo-v1430 AntennaInfoDedicated-v1430 OPTIONAL, -- Need ON

pucch-ConfigDedicated-v1430 PUCCH-ConfigDedicated-v1430 OPTIONAL, -- Need ON

pdsch-ConfigDedicated-v1430 PDSCH-ConfigDedicated-v1430 OPTIONAL, -- Need ON

pusch-ConfigDedicated-v1430 PUSCH-ConfigDedicated-v1430 OPTIONAL, -- Need ON

soundingRS-UL-PeriodicConfigDedicatedList-r14 SEQUENCE (SIZE (1..2)) OF SoundingRS-UL-ConfigDedicated OPTIONAL, -- Cond PeriodicSRSPCell

soundingRS-UL-PeriodicConfigDedicatedUpPTsExtList-r14 SEQUENCE (SIZE (1..4)) OF SoundingRS-UL-ConfigDedicatedUpPTsExt-r13 OPTIONAL, -- Cond PeriodicSRSExt

soundingRS-UL-AperiodicConfigDedicatedList-r14 SEQUENCE (SIZE (1..2)) OF SoundingRS-UL-ConfigDedicatedAperiodic-r10 OPTIONAL, -- Cond AperiodicSRS

soundingRS-UL-ConfigDedicatedApUpPTsExtList-r14 SEQUENCE (SIZE (1..4)) OF SoundingRS-UL-ConfigDedicatedAperiodicUpPTsExt-r13 OPTIONAL, -- Cond AperiodicSRSExt

csi-RS-Config-v1430 CSI-RS-Config-v1430 OPTIONAL, -- Need ON

csi-RS-ConfigZP-ApList-r14 CSI-RS-ConfigZP-ApList-r14 OPTIONAL, -- Need ON

cqi-ReportConfig-v1430 CQI-ReportConfig-v1430 OPTIONAL, -- Need ON

semiOpenLoop-r14 BOOLEAN OPTIONAL -- Need ON

]],

[[ csi-RS-Config-v1480 CSI-RS-Config-v1480 OPTIONAL -- Need ON

]],

[[ physicalConfigDedicatedSTTI-r15 PhysicalConfigDedicatedSTTI-r15 OPTIONAL,-- Need ON

pdsch-ConfigDedicated-v1530 PDSCH-ConfigDedicated-v1530 OPTIONAL,-- Need ON

pusch-ConfigDedicated-v1530 PUSCH-ConfigDedicated-v1530 OPTIONAL,-- Need ON

cqi-ReportConfig-v1530 CQI-ReportConfig-v1530 OPTIONAL,-- Need ON

antennaInfo-v1530 AntennaInfoDedicated-v1530 OPTIONAL,-- Need ON

csi-RS-Config-v1530 CSI-RS-Config-v1530 OPTIONAL,-- Need ON

uplinkPowerControlDedicated-v1530

UplinkPowerControlDedicated-v1530 OPTIONAL, -- Need ON

semiStaticCFI-Config-r15 CHOICE{

release NULL,

setup CHOICE{

cfi-Config-r15 CFI-Config-r15,

cfi-PatternConfig-r15 CFI-PatternConfig-r15

}

} OPTIONAL, -- Need ON

blindPDSCH-Repetition-Config-r15 CHOICE{

release NULL,

setup SEQUENCE {

blindSubframePDSCH-Repetitions-r15 BOOLEAN,

blindSlotSubslotPDSCH-Repetitions-r15 BOOLEAN,

maxNumber-SubframePDSCH-Repetitions-r15 ENUMERATED {n4,n6} OPTIONAL, -- Need ON

maxNumber-SlotSubslotPDSCH-Repetitions-r15 ENUMERATED {n4,n6} OPTIONAL, -- Need ON

rv-SubframePDSCH-Repetitions-r15 ENUMERATED {dlrvseq1, dlrvseq2} OPTIONAL, -- Need ON

rv-SlotsublotPDSCH-Repetitions-r15 ENUMERATED {dlrvseq1, dlrvseq2} OPTIONAL, -- Need ON

numberOfProcesses-SubframePDSCH-Repetitions-r15 INTEGER(1..16) OPTIONAL, -- Need ON

numberOfProcesses-SlotSubslotPDSCH-Repetitions-r15 INTEGER(1..16) OPTIONAL, -- Need ON

mcs-restrictionSubframePDSCH-Repetitions-r15 ENUMERATED {n0, n1} OPTIONAL, -- Need ON

mcs-restrictionSlotSubslotPDSCH-Repetitions-r15 ENUMERATED {n0, n1} OPTIONAL -- Need ON

}

} OPTIONAL -- Need ON

]],

[[ spucch-Config-v1550 SPUCCH-Config-v1550 OPTIONAL -- Need ON

]],

[[ pdsch-ConfigDedicated-v16xy PDSCH-ConfigDedicated-v16xy OPTIONAL, -- Need ON

pusch-ConfigDedicated-v16xy PUSCH-ConfigDedicated-v16xy OPTIONAL, -- Need ON

ce-CSI-RS-Feedback-r16 ENUMERATED {enabled} OPTIONAL, -- Need OR

resourceReservationConfigDedicatedDL-r16 SetupRelease {ResourceReservationConfigDedicatedDL-r16} OPTIONAL, -- Need ON

resourceReservationConfigDedicatedUL-r16 SetupRelease {ResourceReservationConfigDedicatedUL-r16} OPTIONAL, -- Need ON

puncturedSubcarriersDL-r16 BIT STRING (SIZE (2)) OPTIONAL, -- Need OR

soundingRS-UL-ConfigDedicatedAdd-r16 SoundingRS-UL-ConfigDedicatedAdd-r16

OPTIONAL, -- Need ON

uplinkPowerControlAddSRS-r16 UplinkPowerControlAddSRS-r16 OPTIONAL, -- Need ON

soundingRS-VirtualCellID-r16 SoundingRS-VirtualCellID-r16 OPTIONAL, -- Need ON

widebandPRG-r16 WidebandPRG-r16 OPTIONAL -- Need ON

]]

}

PhysicalConfigDedicated-v1370 ::= SEQUENCE {

pucch-ConfigDedicated-v1370 PUCCH-ConfigDedicated-v1370 OPTIONAL -- Cond PUCCH-Format4or5

}

PhysicalConfigDedicated-v13c0 ::= SEQUENCE {

pucch-ConfigDedicated-v13c0 PUCCH-ConfigDedicated-v13c0

}

PhysicalConfigDedicatedSCell-r10 ::= SEQUENCE {

-- DL configuration as well as configuration applicable for DL and UL

nonUL-Configuration-r10 SEQUENCE {

antennaInfo-r10

AntennaInfoDedicated-r10 OPTIONAL, -- Need ON

crossCarrierSchedulingConfig-r10

CrossCarrierSchedulingConfig-r10 OPTIONAL, -- Need ON

csi-RS-Config-r10 CSI-RS-Config-r10 OPTIONAL, -- Need ON

pdsch-ConfigDedicated-r10 PDSCH-ConfigDedicated OPTIONAL -- Need ON

} OPTIONAL, -- Cond SCellAdd

-- UL configuration

ul-Configuration-r10 SEQUENCE {

antennaInfoUL-r10 AntennaInfoUL-r10 OPTIONAL, -- Need ON

pusch-ConfigDedicatedSCell-r10

PUSCH-ConfigDedicatedSCell-r10 OPTIONAL, -- Cond PUSCH-SCell1

uplinkPowerControlDedicatedSCell-r10

UplinkPowerControlDedicatedSCell-r10 OPTIONAL, -- Need ON

cqi-ReportConfigSCell-r10 CQI-ReportConfigSCell-r10 OPTIONAL, -- Need ON

soundingRS-UL-ConfigDedicated-r10

SoundingRS-UL-ConfigDedicated OPTIONAL, -- Need ON

soundingRS-UL-ConfigDedicated-v1020

SoundingRS-UL-ConfigDedicated-v1020 OPTIONAL, -- Need ON

soundingRS-UL-ConfigDedicatedAperiodic-r10

SoundingRS-UL-ConfigDedicatedAperiodic-r10 OPTIONAL -- Need ON

} OPTIONAL, -- Cond CommonUL

...,

[[ -- DL configuration as well as configuration applicable for DL and UL

csi-RS-ConfigNZPToReleaseList-r11

CSI-RS-ConfigNZPToReleaseList-r11 OPTIONAL, -- Need ON

csi-RS-ConfigNZPToAddModList-r11

CSI-RS-ConfigNZPToAddModList-r11 OPTIONAL, -- Need ON

csi-RS-ConfigZPToReleaseList-r11

CSI-RS-ConfigZPToReleaseList-r11 OPTIONAL, -- Need ON

csi-RS-ConfigZPToAddModList-r11

CSI-RS-ConfigZPToAddModList-r11 OPTIONAL, -- Need ON

epdcch-Config-r11 EPDCCH-Config-r11 OPTIONAL, -- Need ON

pdsch-ConfigDedicated-v1130 PDSCH-ConfigDedicated-v1130 OPTIONAL, -- Need ON

-- UL configuration

cqi-ReportConfig-v1130 CQI-ReportConfig-v1130 OPTIONAL, -- Need ON

pusch-ConfigDedicated-v1130

PUSCH-ConfigDedicated-v1130 OPTIONAL, -- Cond PUSCH-SCell1

uplinkPowerControlDedicatedSCell-v1130

UplinkPowerControlDedicated-v1130 OPTIONAL -- Need ON

]],

[[ antennaInfo-v1250 AntennaInfoDedicated-v1250 OPTIONAL, -- Need ON

eimta-MainConfigSCell-r12

EIMTA-MainConfigServCell-r12 OPTIONAL, -- Need ON

cqi-ReportConfigSCell-v1250 CQI-ReportConfig-v1250 OPTIONAL, -- Need ON

uplinkPowerControlDedicatedSCell-v1250

UplinkPowerControlDedicated-v1250 OPTIONAL, -- Need ON

csi-RS-Config-v1250 CSI-RS-Config-v1250 OPTIONAL -- Need ON

]],

[[ pdsch-ConfigDedicated-v1280 PDSCH-ConfigDedicated-v1280 OPTIONAL -- Need ON

]],

[[ pucch-Cell-r13 ENUMERATED {true} OPTIONAL, -- Cond PUCCH-SCell1

pucch-SCell CHOICE{

release NULL,

setup SEQUENCE {

pucch-ConfigDedicated-r13

PUCCH-ConfigDedicated-r13 OPTIONAL, -- Need ON

schedulingRequestConfig-r13

SchedulingRequestConfigSCell-r13 OPTIONAL, -- Need ON

tpc-PDCCH-ConfigPUCCH-SCell-r13

TPC-PDCCH-ConfigSCell-r13 OPTIONAL, -- Need ON

pusch-ConfigDedicated-r13

PUSCH-ConfigDedicated-r13 OPTIONAL, -- Cond PUSCH-SCell

uplinkPowerControlDedicated-r13

UplinkPowerControlDedicatedSCell-v1310 OPTIONAL -- Need ON

}

} OPTIONAL, -- Need ON

crossCarrierSchedulingConfig-r13

CrossCarrierSchedulingConfig-r13 OPTIONAL, -- Cond Cross-Carrier-Config

pdcch-ConfigSCell-r13 PDCCH-ConfigSCell-r13 OPTIONAL, -- Need ON

cqi-ReportConfig-v1310 CQI-ReportConfig-v1310 OPTIONAL, -- Need ON

pdsch-ConfigDedicated-v1310 PDSCH-ConfigDedicated-v1310 OPTIONAL, -- Need ON

soundingRS-UL-ConfigDedicated-v1310

SoundingRS-UL-ConfigDedicated-v1310 OPTIONAL, -- Need ON

soundingRS-UL-ConfigDedicatedUpPTsExt-r13

SoundingRS-UL-ConfigDedicatedUpPTsExt-r13 OPTIONAL, -- Need ON

soundingRS-UL-ConfigDedicatedAperiodic-v1310

SoundingRS-UL-ConfigDedicatedAperiodic-v1310 OPTIONAL, -- Need ON

soundingRS-UL-ConfigDedicatedAperiodicUpPTsExt-r13

SoundingRS-UL-ConfigDedicatedAperiodicUpPTsExt-r13 OPTIONAL, -- Need ON

csi-RS-Config-v1310 CSI-RS-Config-v1310 OPTIONAL, -- Need ON

laa-SCellConfiguration-r13 LAA-SCellConfiguration-r13 OPTIONAL, -- Need ON

csi-RS-ConfigNZPToAddModListExt-r13 CSI-RS-ConfigNZPToAddModListExt-r13 OPTIONAL, -- Need ON

csi-RS-ConfigNZPToReleaseListExt-r13 CSI-RS-ConfigNZPToReleaseListExt-r13 OPTIONAL -- Need ON

]],

[[ cqi-ReportConfig-v1320 CQI-ReportConfig-v1320 OPTIONAL -- Need ON

]],

[[ laa-SCellConfiguration-v1430 LAA-SCellConfiguration-v1430

OPTIONAL, -- Need ON

typeB-SRS-TPC-PDCCH-Config-r14 SRS-TPC-PDCCH-Config-r14 OPTIONAL, -- Need ON

uplinkPUSCH-LessPowerControlDedicated-v1430 UplinkPUSCH-LessPowerControlDedicated-v1430 OPTIONAL, -- Need ON

soundingRS-UL-PeriodicConfigDedicatedList-r14 SEQUENCE (SIZE (1..2)) OF SoundingRS-UL-ConfigDedicated OPTIONAL, -- Cond PeriodicSRS

soundingRS-UL-PeriodicConfigDedicatedUpPTsExtList-r14 SEQUENCE (SIZE (1..4)) OF SoundingRS-UL-ConfigDedicatedUpPTsExt-r13 OPTIONAL, -- Cond PeriodicSRSExt

soundingRS-UL-AperiodicConfigDedicatedList-r14 SEQUENCE (SIZE (1..2)) OF SoundingRS-AperiodicSet-r14 OPTIONAL, -- Cond AperiodicSRS

soundingRS-UL-ConfigDedicatedApUpPTsExtList-r14 SEQUENCE (SIZE (1..4)) OF SoundingRS-AperiodicSetUpPTsExt-r14 OPTIONAL, -- Cond AperiodicSRSExt

must-Config-r14 CHOICE{

release NULL,

setup SEQUENCE {

k-max-r14 ENUMERATED {l1, l3},

p-a-must-r14 ENUMERATED {

dB-6, dB-4dot77, dB-3, dB-1dot77,

dB0, dB1, dB2, dB3} OPTIONAL -- Need ON

}

} OPTIONAL, -- Need ON

pusch-ConfigDedicated-v1430 PUSCH-ConfigDedicatedSCell-v1430 OPTIONAL, -- Need ON

csi-RS-Config-v1430 CSI-RS-Config-v1430 OPTIONAL, -- Need ON

csi-RS-ConfigZP-ApList-r14 CSI-RS-ConfigZP-ApList-r14 OPTIONAL, -- Need ON

cqi-ReportConfig-v1430 CQI-ReportConfig-v1430 OPTIONAL, -- Need ON

semiOpenLoop-r14 BOOLEAN OPTIONAL, -- Need ON

pdsch-ConfigDedicatedSCell-v1430 PDSCH-ConfigDedicatedSCell-v1430 OPTIONAL -- Need ON

]],

[[ csi-RS-Config-v1480 CSI-RS-Config-v1480 OPTIONAL -- Need ON

]],

[[ physicalConfigDedicatedSTTI-r15 PhysicalConfigDedicatedSTTI-r15 OPTIONAL, -- Need ON

pdsch-ConfigDedicated-v1530 PDSCH-ConfigDedicated-v1530 OPTIONAL, -- Need ON

dummy CQI-ReportConfig-v1530 OPTIONAL, -- Need ON

cqi-ReportConfigSCell-r15 CQI-ReportConfigSCell-r15 OPTIONAL, -- Need ON

cqi-ShortConfigSCell-r15 CQI-ShortConfigSCell-r15 OPTIONAL, -- Need ON

csi-RS-Config-v1530 CSI-RS-Config-v1530 OPTIONAL, -- Need ON

uplinkPowerControlDedicatedSCell-v1530

UplinkPowerControlDedicated-v1530 OPTIONAL, -- Need ON

laa-SCellConfiguration-v1530 LAA-SCellConfiguration-v1530 OPTIONAL, -- Need ON

pusch-ConfigDedicated-v1530 PUSCH-ConfigDedicatedScell-v1530 OPTIONAL, -- Cond AUL

semiStaticCFI-Config-r15 CHOICE{

release NULL,

setup CHOICE{

cfi-Config-r15 CFI-Config-r15,

cfi-PatternConfig-r15 CFI-PatternConfig-r15

}

} OPTIONAL, -- Need ON

blindPDSCH-Repetition-Config-r15 CHOICE{

release NULL,

setup SEQUENCE {

blindSubframePDSCH-Repetitions-r15 BOOLEAN,

blindSlotSubslotPDSCH-Repetitions-r15 BOOLEAN,

maxNumber-SubframePDSCH-Repetitions-r15 ENUMERATED {n4,n6} OPTIONAL, -- Need ON

maxNumber-SlotSubslotPDSCH-Repetitions-r15 ENUMERATED {n4,n6} OPTIONAL, -- Need ON

rv-SubframePDSCH-Repetitions-r15 ENUMERATED {dlrvseq1, dlrvseq2} OPTIONAL, -- Need ON

rv-SlotsublotPDSCH-Repetitions-r15 ENUMERATED {dlrvseq1, dlrvseq2} OPTIONAL, -- Need ON

numberOfProcesses-SubframePDSCH-Repetitions-r15 INTEGER(1..16) OPTIONAL, -- Need ON

numberOfProcesses-SlotSubslotPDSCH-Repetitions-r15 INTEGER(1..16) OPTIONAL, -- Need ON

mcs-restrictionSubframePDSCH-Repetitions-r15 ENUMERATED {n0, n1} OPTIONAL, -- Need ON

mcs-restrictionSlotSubslotPDSCH-Repetitions-r15 ENUMERATED {n0, n1} OPTIONAL -- Need ON

}

} OPTIONAL -- Need ON

]],

[[ spucch-Config-v1550 SPUCCH-Config-v1550 OPTIONAL -- Need ON

]],

[[ soundingRS-UL-ConfigDedicatedAdd-r16 SoundingRS-UL-ConfigDedicatedAdd-r16

OPTIONAL, -- Need ON

uplinkPowerControlAddSRS-r16 UplinkPowerControlAddSRS-r16

OPTIONAL, -- Need ON

soundingRS-VirtualCellID-r16 SoundingRS-VirtualCellID-r16

OPTIONAL, -- Need ON

widebandPRG-r16 WidebandPRG-r16 OPTIONAL -- Need ON

]]

}

PhysicalConfigDedicatedSCell-v1370 ::= SEQUENCE {

pucch-SCell-v1370 CHOICE{

release NULL,

setup SEQUENCE {

pucch-ConfigDedicated-v1370 PUCCH-ConfigDedicated-v1370 OPTIONAL -- Cond PUCCH-Format4or5

}

}

}

PhysicalConfigDedicatedSCell-v13c0 ::= SEQUENCE {

pucch-SCell-v13c0 CHOICE{

release NULL,

setup SEQUENCE {

pucch-ConfigDedicated-v13c0 PUCCH-ConfigDedicated-v13c0

}

}

}

CFI-Config-r15 ::= SEQUENCE {

cfi-SubframeNonMBSFN-r15 INTEGER (1..4) OPTIONAL, -- Need ON

cfi-SlotSubslotNonMBSFN-r15 INTEGER (1..3) OPTIONAL, -- Need ON

cfi-SubframeMBSFN-r15 INTEGER (1..2) OPTIONAL, -- Need ON

cfi-SlotSubslotMBSFN-r15 INTEGER (1..2) OPTIONAL -- Need ON

}

CFI-PatternConfig-r15 ::= SEQUENCE {

cfi-PatternSubframe-r15 SEQUENCE (SIZE(10)) OF INTEGER (1..4) OPTIONAL, -- Need ON

cfi-PatternSlotSubslot-r15 SEQUENCE (SIZE(10)) OF INTEGER (1..3) OPTIONAL -- Need ON

}

LAA-SCellConfiguration-r13 ::= SEQUENCE {

subframeStartPosition-r13 ENUMERATED {s0, s07},

laa-SCellSubframeConfig-r13 BIT STRING (SIZE(8))

}

LAA-SCellConfiguration-v1430 ::= SEQUENCE {

crossCarrierSchedulingConfig-UL-r14 CHOICE {

release NULL,

setup SEQUENCE {

crossCarrierSchedulingConfigLAA-UL-r14 CrossCarrierSchedulingConfigLAA-UL-r14

}

} OPTIONAL, -- Cond Cross-Carrier-ConfigUL

lbt-Config-r14 LBT-Config-r14 OPTIONAL, -- Need ON

pdcch-ConfigLAA-r14 PDCCH-ConfigLAA-r14 OPTIONAL, -- Need ON

absenceOfAnyOtherTechnology-r14 ENUMERATED {true} OPTIONAL, -- Need OR

soundingRS-UL-ConfigDedicatedAperiodic-v1430

SoundingRS-UL-ConfigDedicatedAperiodic-v1430 OPTIONAL -- Need ON

}

LAA-SCellConfiguration-v1530 ::= SEQUENCE {

aul-Config-r15 AUL-Config-r15 OPTIONAL, -- Need ON

pusch-ModeConfigLAA-r15 PUSCH-ModeConfigLAA-r15 OPTIONAL -- Need OR

}

PUSCH-ModeConfigLAA-r15 ::= SEQUENCE {

laa-PUSCH-Mode1 BOOLEAN,

laa-PUSCH-Mode2 BOOLEAN,

laa-PUSCH-Mode3 BOOLEAN

}

LBT-Config-r14 ::= CHOICE{

maxEnergyDetectionThreshold-r14 INTEGER(-85..-52),

energyDetectionThresholdOffset-r14 INTEGER(-13..20)

}

CSI-RS-ConfigNZPToAddModList-r11 ::= SEQUENCE (SIZE (1..maxCSI-RS-NZP-r11)) OF CSI-RS-ConfigNZP-r11

CSI-RS-ConfigNZPToAddModListExt-r13 ::= SEQUENCE (SIZE (1..maxCSI-RS-NZP-v1310)) OF CSI-RS-ConfigNZP-r11

CSI-RS-ConfigNZPToAddModList-r15 ::= SEQUENCE (SIZE (1..maxCSI-RS-NZP-r13)) OF CSI-RS-ConfigNZP-r11

CSI-RS-ConfigNZPToReleaseList-r11 ::= SEQUENCE (SIZE (1..maxCSI-RS-NZP-r11)) OF CSI-RS-ConfigNZPId-r11

CSI-RS-ConfigNZPToReleaseListExt-r13 ::= SEQUENCE (SIZE (1..maxCSI-RS-NZP-v1310)) OF CSI-RS-ConfigNZPId-v1310

CSI-RS-ConfigNZPToReleaseList-r15 ::= SEQUENCE (SIZE (1..maxCSI-RS-NZP-r13)) OF CSI-RS-ConfigNZPId-r13

CSI-RS-ConfigZPToAddModList-r11 ::= SEQUENCE (SIZE (1..maxCSI-RS-ZP-r11)) OF CSI-RS-ConfigZP-r11

CSI-RS-ConfigZPToReleaseList-r11 ::= SEQUENCE (SIZE (1..maxCSI-RS-ZP-r11)) OF CSI-RS-ConfigZPId-r11

PhysicalConfigDedicatedSTTI-r15 ::= CHOICE {

release NULL,

setup SEQUENCE {

antennaInfoDedicatedSTTI-r15 AntennaInfoDedicatedSTTI-r15 OPTIONAL, -- Need ON

antennaInfoUL-STTI-r15 AntennaInfoUL-STTI-r15 OPTIONAL, -- Need ON

pucch-ConfigDedicated-v1530 PUCCH-ConfigDedicated-v1530 OPTIONAL, -- Need ON

schedulingRequestConfig-v1530 SchedulingRequestConfig-v1530 OPTIONAL, -- Need ON

uplinkPowerControlDedicatedSTTI-r15 UplinkPowerControlDedicatedSTTI-r15 OPTIONAL, --Need ON

cqi-ReportConfig-r15 CQI-ReportConfig-r15 OPTIONAL, -- Need ON

csi-RS-Config-r15 CSI-RS-Config-r15 OPTIONAL, -- Need ON

csi-RS-ConfigNZPToReleaseList-r15 CSI-RS-ConfigNZPToReleaseList-r15 OPTIONAL, -- Need ON

csi-RS-ConfigNZPToAddModList-r15 CSI-RS-ConfigNZPToAddModList-r15 OPTIONAL, -- Need ON

csi-RS-ConfigZPToReleaseList-r15 CSI-RS-ConfigZPToReleaseList-r11 OPTIONAL, -- Need ON

csi-RS-ConfigZPToAddModList-r11 CSI-RS-ConfigZPToAddModList-r11 OPTIONAL, -- Need ON

csi-RS-ConfigZP-ApList-r15 CSI-RS-ConfigZP-ApList-r14 OPTIONAL, -- Need ON

eimta-MainConfig-r12 EIMTA-MainConfig-r12 OPTIONAL, -- Need ON

eimta-MainConfigServCell-r15 EIMTA-MainConfigServCell-r12 OPTIONAL, -- Need ON

semiOpenLoopSTTI-r15 BOOLEAN,

slotOrSubslotPDSCH-Config-r15 SlotOrSubslotPDSCH-Config-r15 OPTIONAL, -- Need ON

slotOrSubslotPUSCH-Config-r15 SlotOrSubslotPUSCH-Config-r15 OPTIONAL, -- Need ON

spdcch-Config-r15 SPDCCH-Config-r15 OPTIONAL, -- Need ON

spucch-Config-r15 SPUCCH-Config-r15 OPTIONAL, -- Need ON

srs-DCI7-TriggeringConfig-r15 BOOLEAN,

shortProcessingTime-r15 BOOLEAN,

shortTTI-r15 ShortTTI-r15 OPTIONAL -- Need ON

}

}

SoundingRS-AperiodicSet-r14 ::= SEQUENCE{

srs-CC-SetIndexList-r14

SEQUENCE (SIZE (1..4)) OF SRS-CC-SetIndex-r14

OPTIONAL, -- Cond SRS-Trigger-TypeA

soundingRS-UL-ConfigDedicatedAperiodic-r14

SoundingRS-UL-ConfigDedicatedAperiodic-r10

}

SoundingRS-AperiodicSetUpPTsExt-r14 ::= SEQUENCE{

srs-CC-SetIndexList-r14

SEQUENCE (SIZE (1..4)) OF SRS-CC-SetIndex-r14

OPTIONAL, -- Cond SRS-Trigger-TypeA

soundingRS-UL-ConfigDedicatedAperiodicUpPTsExt-r14

SoundingRS-UL-ConfigDedicatedAperiodicUpPTsExt-r13

}

ShortTTI-r15 ::= SEQUENCE {

dl-STTI-Length-r15 ShortTTI-Length-r15 OPTIONAL, -- Need OR

ul-STTI-Length-r15 ShortTTI-Length-r15 OPTIONAL -- Need OR

}

ShortTTI-Length-r15 ::= ENUMERATED {slot, subslot}

SoundingRS-VirtualCellID-r16 ::= SEQUENCE {

srs-VirtualCellID-r16 INTEGER (0..503),

srs-VirtualCellID-AllSRS-r16 BOOLEAN

}

WidebandPRG-r16 ::= SEQUENCE {

widebandPRG-Subframe-r16 BOOLEAN,

widebandPRG-SlotSubslot-r16 BOOLEAN

}

ResourceReservationConfigDedicatedDL-r16 ::= SEQUENCE {

resourceReservationDedicatedDL-r16 ResourceReservationConfigDL-r16 OPTIONAL -- Need OP

}

ResourceReservationConfigDedicatedUL-r16 ::= SEQUENCE {

resourceReservationDedicatedUL-r16 ResourceReservationConfigUL-r16 OPTIONAL –- Need OP

}

-- ASN1STOP

| *PhysicalConfigDedicated* field descriptions | |
| --- | --- |
| ***absenceOfAnyOtherTechnology***  Presence of this field indicates absence on a long term basis (e.g. by level of regulation) of any other technology sharing the carrier; absence of this field indicates the potential presence of any other technology sharing the carrier, as specified in TS 37.213 [94]. | |
| ***additionalSpectrumEmissionPCell***  E-UTRAN does not configure this field in this release of the specification. | |
| ***antennaInfo***  A choice is used to indicate whether the *antennaInfo* is signalled explicitly or set to the default antenna configuration as specified in clause 9.2.4. | |
| ***blindSlotSubslotPDSCH-Repetitions***  Enables HARQ-less/blind slot or subslot PDSCH repetitions for a UE in a given cell, i.e. back to back slot/subslot PDSCH transmissions for the same transport block. The number of slot/subslot PDSCH transmissions is indicated in the DCI. | |
| ***blindSubframePDSCH-Repetitions***  Enables HARQ-less/blind subframe PDSCH repetitions for a UE in a given cell, i.e. back to back PDSCH transmissions for the same transport block. The number of PDSCH transmissions is indicated in the DCI. | |
| ***ce-CSI-RS-Feedback***  Indicates whether CSI-RS-based CSI feedback is enabled for non-BL UE in CE mode A, see TS 36.213 [23], clause 7.2.2. | | |
| ***ce-Mode***  Indicates the CE mode as specified in TS 36.213 [23]. | |
| ***ce-pdsch-pusch-Enhancement-Config***  Activation of new numbers of repetitions for PUSCH and modulation restrictions for PDSCH/PUSCH in CE mode A, see TS 36.212 [22] and TS 36.213 [23]. | |
| ***cqi-ShortConfigSCell***  Indicates whether the CSI (CQI/PMI/RI/PTI/CRI) reporting resource configured by *cqi-ShortConfigSCell* is available upon receiving the SCell activation command for this SCell. E-UTRAN only configures this field when transmission mode 1-8 is configured for the serving cell on this carrier frequency. | |
| ***csi-RS-Config***  For a serving frequency E-UTRAN does not configure *csi-RS-Config* (includes *zeroTxPowerCSI-RS*) when transmission mode 10 is configured for the serving cell on this carrier frequency. | |
| ***csi-RS-ConfigNZPToAddModList***  For a serving frequency E-UTRAN configures one or more *CSI-RS-ConfigNZP* only when transmission mode 9 or 10 is configured for the serving cell on this carrier frequency. For a serving frequency, EUTRAN configures a maximum number of *CSI-RS-ConfigNZP* in accordance with transmission mode (including CSI processes), eMIMO (including class) and associated UE capabilities (e.g. k-Max, n-MaxList). | |
| ***csi-RS-ConfigZP-ApList***  The aperiodic ZP CSI-RS for PDSCH rate matching. The field *subframeConfig* is applicable to semi-persistent CSI RS reporting. In other cases, the UE shall ignore field *subframeConfig*. | |
| ***csi-RS-ConfigZPToAddModList***  For a serving frequency E-UTRAN configures one or more *CSI-RS-ConfigZP* only when transmission mode 10 is configured for the serving cell on this carrier frequency. | |
| ***dl-STTI-Length, ul-STTI-Length***  Indicates the DL and UL short TTI lengths. Value slot corresponds to 7 OFDM symbols and value subslot corresponds to 2 or 3 OFDM symbols. E-UTRAN configures the same value for all serving cells sending PUCCH feedback on the same cell. If one SCell is configured with short TTI in the group of cells configured to send PUCCH on the same cell, the cell carrying PUCCH shall be configured with short TTI. E-UTRAN can configure different value of *dl-STTI-Length* and *ul-STTI-Length* for serving cells sending PUCCH feedback on different cells. E-UTRAN does not configure the combination {slot,subslot} for {DL,UL}. | |
| ***dummy***  This field is not used in the specification. If received it shall be ignored by the UE. | |
| ***eimta-MainConfigPCell, eimta-MainConfigSCell***  If E-UTRAN configures *eimta-MainConfigPCell* or *eimta-MainConfigSCell* for one serving cell in a frequency band, E-UTRAN configures *eimta-MainConfigPCell* or *eimta-MainConfigSCell* for all serving cells residing on the frequency band. E-UTRAN configures *eimta-MainConfigPCell* or *eimta-MainConfigSCell* only if *eimta-MainConfig* is configured. | |
| ***energyDetectionThresholdOffset***  Indicates the offset to the default maximum energy detection threshold value. Unit in dB. Value -13 corresponds to -13dB, value -12 corresponds to -12dB, and so on (i.e. in steps of 1dB) as specified in TS 37.213 [94]. | |
| ***epdcch-Config***  indicates the *EPDCCH-Config* for the cell. E-UTRAN does not configure *EPDCCH-Config* for an SCell that is configured with value *other* for *schedulingCellInfo* in *CrossCarrierSchedulingConfig*. | |
| ***k-max***  Indicates the maximum number of interfering spatial layers signaled in the assistance information for MUST. Value l1 corresponds to 1 layer, Value l3 corresponds to 3 layers. | |
| ***laa-PUSCH-Mode1, laa-PUSCH-Mode2, laa-PUSCH-Mode3***  Indicates whether LAA PUSCH mode 1, 2 and/or 3 is configured as specified in TS 36.212 [22], clause 5.3.3.1. | |
| ***laa-SCellSubframeConfig***  A bit-map indicating LAA SCell subframe configuration, "1" denotes that the corresponding subframe is allocated as MBSFN subframe. The bitmap is interpreted as follows:  Starting from the first/leftmost bit in the bitmap, the allocation applies to subframes #1, #2, #3, #4, #6, #7, #8, and #9. | |
| ***maxEnergyDetectionThreshold***  Indicates the absolute maximum energy detection threshold value. Unit in dBm. Value -85 corresponds to -85 dBm, value -84 corresponds to -84 dBm, and so on (i.e. in steps of 1dBm) as specified in TS 36.213 [23]. If the field is not configured, the UE shall use a default maximum energy detection threshold value as specified in TS 37.213 [94]. | |
| ***maxNumber-SlotSubslotPDSCH-Repetitions***  Indicates the maximum number of PDSCH transmissions for slot or subslot PDSCH repetitions. | |
| ***maxNumber-SubframePDSCH-Repetitions***  Indicates the maximum number of PDSCH transmissions for subframe PDSCH repetitions. | |
| ***mcs-restrictionSlotSubslotPDSCH-Repetitions***  Indicates the MCS restriction in terms of number of non-addressable MSB in the MCS bit-field for slot or subslot PDSCH repetition applicable when k > 1. | |
| ***mcs-restrictionSubframePDSCH-Repetitions***  Indicates MCS restriction in terms of number of non-addressable MSB in the MCS bit-field for subframe PDSCH repetition applicable when k > 1. | |
| ***resourceReservationConfigDedicatedDL***  Indicates whether the DL resource reservation is enabled for the UE, e.g. for NR coexistence. If the field is set to *setup* and *resourceReservationDedicatedDL* is not included, then *resourceReservationConfigCommonDL* in *SystemInformationBlockTypeXX* applies. | |
| *resourceReservationConfigDedicatedUL*  Indicates whether the UL resource reservation is enabled for the UE, for NR coexistence. If the field is set to *setup* and *resourceReservationDedicatedUL* is not included, then *resourceReservationConfigCommonUL* in *SystemInformationBlockTypeXX* applies. | |
| ***numberOfProcesses-SlotSubslotPDSCH-Repetitions***  Indicates the number of HARQ processes for slot/subslot PDSCH repetition applicable when k > 1 configured per serving cell. | |
| ***numberOfProcesses-SubframePDSCH-Repetitions***  Indicates the number of HARQ processes for subframe PDSCH repetition applicable when k > 1 configured per serving cell. | |
| ***p-a-must***  Parameter: , see TS 36.213 [23], clause 5.2. Value dB-6 corresponds to -6 dB, dB-4dot77 corresponds to -4.77 dB etc. | |
| ***pdsch-ConfigDedicated-v1130***  For a serving frequency, E-UTRAN configures *pdsch-ConfigDedicated-v1130* only when transmission mode 10 is configured for the serving cell on this carrier frequency. | |
| ***pdsch-ConfigDedicated-v1280***  For a serving frequency, E-UTRAN configures *pdsch-ConfigDedicated-v1280* only when transmission mode 9 or 10 is configured for the serving cell on this carrier frequency. | |
| ***pucch-Cell***  If present, PUCCH feedback of this SCell is sent on the PUCCH SCell. If absent, PUCCH feedback of this SCell is sent on PCell or PSCell, or if the cell concerns the PUCCH SCell, on the concerned cell. If this field is not modified upon change of PUCCH SCell, the UE shall always send the PUCCH feedback of the concerned SCell using the configured PUCCH SCell. | |
| ***pucch-ConfigDedicated***  E-UTRAN configures *pucch-ConfigDedicated-r13* only if *pucch-ConfigDedicated* (i.e., without suffix) is not configured. UE shall ignore *pucch-ConfigDedicated-v1020* when *pucch-ConfigDedicated-r13* is configured. | |
| ***pucch-SCell***  If present, the concerned SCell is the PUCCH SCell. E-UTRAN only configures this field upon SCell addition i.e. this field is only released when the SCell is released. The field is not applicable for an LAA SCell in this release. | |
| ***puncturedSubcarriersDL***  Indicates number of punctured DL subcarriers and their locations, see TS 36.211 [31]. | |
| ***pusch-ConfigDedicated-r13***  E-UTRAN configures *pusch-ConfigDedicated-r13* only if *pusch-ConfigDedicated* is not configured. | |
| ***pusch-ConfigDedicated-v1250***  E-UTRAN configures *pusch-ConfigDedicated-v1250* only if *tpc-SubframeSet* is configured. | |
| ***pusch-EnhancementsConfig***  Indicates that the UE shall transmit in the PUSCH enhancement mode if *pusch-EnhancementsConfig* is set to *setup*, see TS 36.211 [21] and TS 36.213 [23]. | |
| ***rv-SlotsublotPDSCH-Repetitions***  Indicates the RV cycling sequence for slot or subslot PDSCH repetition. Value dlrvseq1 = {0, 0, 0, 0} and value dlrvseq2 = {0, 2, 3, 1}. | |
| ***rv-SubframePDSCH-Repetitions***  Indicates the RV cycling sequence for subframe PDSCH repetition. Value dlrvseq1 = {0, 0, 0, 0} and value dlrvseq2 = {0, 2, 3, 1}. | |
| ***semiOpenLoop, semiOpenLoopSTTI***  Value TRUE indicates that semi-open-loop transmission is used for deriving CSI reporting and corresponding PDSCH transmission (DMRS). | |
| ***semiStaticCFI-SlotSubslotNonMBSFN***  Indicates the semi-static control format indicator for slot/subslot operation in non-MBSFN subframes. | |
| ***semiStaticCFI-SlotSubslotMBSFN***  Indicates the semi-static control format indicator for slot/subslot operation in MBSFN subframes. | |
| ***semiStaticCFI-SubframeMBSFN***  Indicates the semi-static control format indicator for subframe operation in MBSFN subframes. | |
| ***semiStaticCFI-SubframeNonMBSFN***  Indicates the semi-static control format indicator for subframe operation in non-MBSFN subframes. | |
| ***shortProcessingTime***  Indicates whether short processing time is configured as specific in TS 36.321 [6]. An SCell can only be configured with short processing if the cell carrying PUCCH for that SCell is configured with short processing time. | |
| ***soundingRS-UL-PeriodicConfigDedicatedList***  Indicates periodic soundingRS configuration except for the extension sounding symbols of the UpPTs subframe. E-UTRAN configures this field in *PhysicalConfigDedicated* only for the UE indicating support of *ce-SRS-Enhancement-r14* or *ce-SRS-EnhancementWithoutComb4-r14*. E-UTRAN configures this field in *PhysicalConfigDedicatedSCell-r10* only for the UE indicating support of *srs-UpPTS-6sym-r14*. | |
| ***soundingRS-UL-PeriodicConfigDedicatedUpPTsExtList***  Indicates periodic soundingRS configuration in extension sounding symbols of the UpPTs subframe. E-UTRAN configures this field in *PhysicalConfigDedicated* only for the UE indicating support of *ce-SRS-Enhancement-r14* or *ce-SRS-EnhancementWithoutComb4-r14*. E-UTRAN configures this field in *PhysicalConfigDedicatedSCell-r10* only for the UE indicating support of *srs-UpPTS-6sym-r14*. | |
| ***soundingRS-UL-AperiodicConfigDedicatedList***  Indicates aperiodic soundingRS configuration except for the extension sounding symbols of the UpPTs subframe. E-UTRAN configures this field in *PhysicalConfigDedicated* only for the UE indicating support of *ce-SRS-Enhancement-r14* or *ce-SRS-EnhancementWithoutComb4-r14*. E-UTRAN configures this field in *PhysicalConfigDedicatedSCell-r10* only for the UE indicating support of *srs-UpPTS-6sym-r14*. | |
| ***soundingRS-UL-DedicatedApUpPTsExtList***  Indicates aperiodic soundingRS configuration in extension sounding symbols of the UpPTs subframe. E-UTRAN configures this field in *PhysicalConfigDedicated* only for the UE indicating support of *ce-SRS-Enhancement-r14* or *ce-SRS-EnhancementWithoutComb4-r14*. E-UTRAN configures this field in *PhysicalConfigDedicatedSCell-r10* only for the UE indicating support of *srs-UpPTS-6sym-r14*. | |
| ***srs-CC-SetIndexList***  Indicates the *srs-CC-SetIndex* list which the *soundingRS-UL-ConfigDedicatedAperiodic* and*soundingRS-UL-ConfigDedicatedAperiodicUpPTsExt* belongs to. | |
| ***srs-DCI7-TriggeringConfig***  Indicates whether SRS triggering via DCI7 is configured. | |
| ***srs-VirtualCellID***  Indicates the virtual cell ID for SRS. | |
| ***srs-VirtualCellID-AllSRS***  Value TRUE indicates the configured virtual cell ID is applied to all SRS symbols. Value FALSE indicates the configured virtual cell ID is applied only to additional SRS symbols. | |
| ***subframeStartPosition***  Indicates possible starting positions of transmission in the first subframe of the DL transmission burst, see TS 36.211 [21]. Value *s0* means the starting position is subframe boundary, *s07* means the starting position is either subframe boundary or slot boundary. | |
| ***tpc-PDCCH-ConfigPUCCH***  PDCCH configuration for power control of PUCCH using format 3/3A, see TS 36.212 [22]. | |
| ***tpc-PDCCH-ConfigPUSCH***  PDCCH configuration for power control of PUSCH using format 3/3A, see TS 36.212 [22]. | |
| ***typeA-SRS-TPC-PDCCH-Group***  Indicates Type A trigger configuration for SRS transmission on a PUSCH-less SCell. E-UTRAN configures the UE with either *typeA-SRS-TPC-PDCCH-Group* or *typeB-SRS-TPC-PDCCH-Group*, if any. | |
| ***uplinkPowerControlDedicated***  E-UTRAN configures *uplinkPowerControlDedicated-v1130* only if *uplinkPowerControlDedicated* (without suffix) is configured. | |
| ***uplinkPowerControlDedicatedSCell***  E-UTRAN configures *uplinkPowerControlDedicatedSCell-v1130* only if *uplinkPowerControlDedicatedSCell-r10* is configured for this serving cell. | |
| ***widebandPRG-SlotSubslot***  Indicates whether the precoding resource block group size is the whole scheduled bandwidth for slot or subslot PDSCH operation as specified in TS 36.213 [23]. | |
| ***widebandPRG-Subframe***  Indicates whether the precoding resource block group size is the whole scheduled bandwidth for subframe PDSCH operation as specified in TS 36.213 [23]. | |

| Conditional presence | Explanation |
| --- | --- |
| *AI-r8* | The field is optionally present, need ON, if *antennaInfoDedicated-r10* is absent. Otherwise the field is not present |
| *AI-r10* | The field is optionally present, need ON, if *antennaInfoDedicated* is absent. Otherwise the field is not present |
| *AperiodicSRS* | If *soundingRS-UL-ConfigDedicatedAperiodic-r10* is absent, the field is optional, Need ON. Otherwise the field is not present and the UE shall delete any existing value for this field. |
| *AperiodicSRSExt* | If *soundingRS-UL-ConfigDedicatedAperiodicUpPTsExt-r13* is absent, the field is optional, Need ON. Otherwise the field is not present and the UE shall delete any existing value for this field. |
| *AUL* | The field is optionally present, need ON, if *aul-config-r15* is present. Otherwise the field is not present. |
| *CommonUL* | The field is mandatory present if *ul-Configuration* of *RadioResourceConfigCommonSCell-r10* is present; otherwise it is optional, need ON. |
| *CQI-r8* | The field is optionally present, need ON, if *cqi-ReportConfig-r10* is absent. Otherwise the field is not present |
| *CQI-r10* | The field is optionally present, need ON, if *cqi-ReportConfig* is absent. Otherwise the field is not present |
| *Cross-Carrier-Config* | The field is optionally present, need ON, if *crossCarrierSchedulingConfig-r10* is absent. Otherwise the field is not present |
| *Cross-Carrier-ConfigUL* | The field is optionally present, need ON, if *crossCarrierSchedulingConfig-r10* and *crossCarrierSchedulingConfig-r13* are absent or *schedulingCellInfo* is set to 'own'. Otherwise the field is not present. |
| *PeriodicSRS* | If *soundingRS-UL-ConfigDedicated-r10* is absent, the field is optional, Need ON. Otherwise the field is not present and the UE shall delete any existing value for this field. |
| *PeriodicSRSPCell* | If *soundingRS-UL-ConfigDedicated* is absent, the field is optional, Need ON. Otherwise the field is not present and the UE shall delete any existing value for this field. |
| *PeriodicSRSExt* | If *soundingRS-UL-ConfigDedicatedUpPTsExt-r13* is absent, the field is optional, Need ON. Otherwise the field is not present and the UE shall delete any existing value for this field. |
| *PUCCH-Format4or5* | The field is mandatory present with *pucch-Format-v1370* set to *setup* if *pucch-ConfigDedicated-r13* is configured and *pucch-ConfigDedicated-r13* indicates PUCCH format 4 or PUCCH format 5; otherwise it is not present and the UE shall delete any existing value for this field. |
| *PUCCH-SCell1* | The field is optionally present, need OR, for SCell not configured with *pucch-configDedicated-r13*. Otherwise it is not present. |
| *PUSCH-SCell* | The field is optionally present, need ON, if *pusch-ConfigDedicatedSCell-r10 and pusch-ConfigDedicated-v1130* are absent. Otherwise the field is not present |
| *PUSCH-SCell1* | The field is optionally present, need ON, for SCell not configured with *pucch-configDedicated-r13*. Otherwise it is not present. |
| *SCellAdd* | The field is mandatory present if *cellIdentification* is present; otherwise it is optional, need ON. |
| *SRS-Trigger-TypeA* | The field is mandatory present if *typeA-SRS-TPC-PDCCH-Group-r14* is present. Otherwise the field is not present and the UE shall delete any existing value for this field. |

NOTE 1: During handover, the UE performs a MAC reset, which involves reverting to the default CQI/ SRS/ SR configuration in accordance with clause 5.3.13 and TS 36.321 [6], clauses 5.9 and 5.2. Hence, for these parts of the dedicated radio resource configuration, the default configuration (rather than the configuration used in the source PCell) is used as the basis for the delta signalling that is included in the message used to perform handover.

NOTE 2: Since delta signalling is not supported for the common SCell configuration, E-UTRAN can only add or release the uplink of an SCell by releasing and adding the concerned SCell.

<<unchanged text skipped>>

#### – *PUR-Config*

The IE *PUR-Config* is used to specify the PUR configuration.

*PUR-Config* information element

-- ASN1START

PUR-Config-r16 ::= SEQUENCE {

pur-ImplicitReleaseAfter-r16 ENUMERATED {e2, e4, e8, spare} OPTIONAL, -- Need OR

pur-Periodicity-r16 ENUMERATED {n8, n16, n32, n64, n128, n256, n512, n1024, n2048, n4096, n8192, spare5, spare4, spare3, spare2, spare1} OPTIONAL, --Need ON

pur-NumOccasions-r16 ENUMERATED {one, infinite},

pur-RNTI-r16 C-RNTI OPTIONAL, -- Need ON

pur-TimeAlignmentTimer-r16 INTEGER (1..8) OPTIONAL, -- Need OR

pur-RSRP-ChangeThreshold-r16 SetupRelease {PUR-RSRP-ChangeThreshold-r16} OPTIONAL, -- Need ON

pur-StartTime-r16 TypeFFS OPTIONAL, -- Need ON

pur-ResponseWindowTimer-r16 ENUMERATED {sf240, sf480, sf960, sf1920, sf3840, sf5760, sf7680, sf10240} OPTIONAL, -- Need ON

pur-MPDCCH-Config-r16 PUR-MPDCCH-Config-r16 OPTIONAL, -- Need ON

pur-PDSCH-FreqHopping-r16 BOOLEAN,

pur-PUCCH-Config-r16 PUR-PUCCH-Config-r16 OPTIONAL, -- Need ON

pur-PUSCH-Config-r16 PUR-PUSCH-Config-r16 OPTIONAL, -- Need ON

...

}

PUR-MPDCCH-Config-r16 ::= SEQUENCE {

mpdcch-FreqHopping-r16 BOOLEAN,

mpdcch-Narrowband-r16 INTEGER (1..maxAvailNarrowBands-r13),

mpdcch-PRB-PairsConfig-r16 SEQUENCE{

numberPRB-Pairs-r16 ENUMERATED {n2, n4, n6, spare1},

resourceBlockAssignment-r11 BIT STRING (SIZE(4))

},

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

mpdcch-StartSF-UESS-r16 CHOICE {

fdd ENUMERATED {v1, v1dot5, v2, v2dot5, v4, v5, v8, v10},

tdd ENUMERATED {v1, v2, v4, v5, v8, v10, v20, spare1}

},

mpdcch-Offset-PUR-SS-r16 ENUMERATED {zero, oneEighth, oneQuarter,

threeEighth, oneHalf, fiveEighth,

threeQuarter, sevenEighth}

}

PUR-PUCCH-Config-r16 ::= SEQUENCE {

n1PUCCH-AN-r16 INTEGER (0..2047) OPTIONAL, -- Need ON

pucch-NumRepetitionCE-Format1-r16 ENUMERATED {n1, n2, n4, n8} OPTIONAL -- Need ON

}

PUR-PUSCH-Config-r16 ::= SEQUENCE {

pur-GrantInfo-r16 CHOICE {

ce-ModeA SEQUENCE {

numRUs-r16 BIT STRING (SIZE(2)),

prb-AllocationInfo-r16 BIT STRING (SIZE(10)),

mcs-r16 BIT STRING (SIZE(4)),

numRepetitions-r16 BIT STRING (SIZE(3))

},

ce-ModeB SEQUENCE {

subPRB-Allocation-r16 BOOLEAN,

numRUs-r16 BOOLEAN,

prb-AllocationInfo-r16 BIT STRING (SIZE(8)),

mcs-r16 BIT STRING (SIZE(4)),

numRepetitions-r16 BIT STRING (SIZE(3))

}

} OPTIONAL, -- Need ON

pur-PUSCH-FreqHopping-r16 BOOLEAN,

p0-UE-PUSCH-r16 INTEGER (-8..7),

alpha-r16 Alpha-r12,

pusch-CyclicShift-r16 ENUMERATED {n0, n6}, pusch-NB-MaxTBS-r16 BOOLEAN

}

PUR-RSRP-ChangeThreshold-r16 ::= SEQUENCE {

rsrp-IncreaseThresh-r16 RSRP-ChangeThresh-r16,

rsrp-DecreaseThresh-r16 RSRP-ChangeThresh-r16 OPTIONAL --Need OP

}

RSRP-ChangeThresh-r16 ::= ENUMERATED {dB4, dB6, dB8, dB10, dB14, dB18, dB22, dB26, dB30, dB34, spare6, spare5, spare4, spare3, spare2, spare1}

-- ASN1STOP

| *PUR-Config* field descriptions | |
| --- | --- |
| ***alpha***  Parameter: *αc*(3). See TS 36.213 [23], clause 5.1.1.1. |
| ***mpdcch-FreqHopping***  Frequency hopping activation/deactivation for MPDCCH. See TS 36.213 [23]. |
| ***mpdcch-Narrowband***  Indicates the index of a narrowband 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 UE-SS for MPDCCH, see TS 36.213 [23]. |
| ***mpdcch-Offset-PUR-SS***  Starting subframes configuration of the MPDCCH search space for PUR, 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-UESS***  Starting subframe configuration for an MPDCCH PUR search space, see TS 36.213 [23]. Value v1 corresponds to 1, value v1dot5 corresponds to 1.5, and so on. |
| ***n1PUCCH-AN***  Indicates UE-specific PUCCH AN 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. |
| ***pucch-NumRepetitionCE-Format1***  Number of PUCCH repetitions for PUCCH format 1/1a, see TS 36.211 [21] and TS 36.213 [23]. When *pur-GrantInfo* is set to *ce-ModeA*, value n1 corresponds to 1 repetition, value n2 corresponds to 2 repetitions, and so on. When *pur-GrantInfo* is set to *ce-ModeB*, actual value corresponds to 4 \* indicated value. | |
| ***pusch-CyclicShift***  Paraneter: See TS 36.211 [21] clause 5.5.2.1.1. Value n0 corresponds to 0 and n6 corresponds to 6. |
| ***pusch-NB-MaxTBS***  Activation of 2984 bits maximum PUSCH TBS in 1.4 MHz in CE mode A, see TS 36.212 [22] and TS 36.213 [23]. |
| ***pur-GrantInfo***  Indicates UL grant for transmission using PUR. Field set to *ce-ModeA* indicates the PUR grant is for CE Mode A and the field set to *ce-ModeB* indicates the PUR grant is for CE Mode B. *numRUs* indicates DCI field for PUSCH number of resource units, see TS 36.213 [23] clause 8.1.6. *prbAllocationInfo* indicates DCI field for PUSCH resource block assignment, see TS 36.212 [22], clause 5.3.3.1.10 (CE Mode A) and clause 5.3.3.1.11 (CE Mode B). *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.  For CE Mode A, *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. For CE Mode B, *subPRB-Allocation* indicates whether sub-PRB resource allocation is used. | |
| ***pur-ImplicitReleaseAfter***  Number of consecutive empty PUR occasions before implicit release, as specified in 5.3.3.x. Value e2 corresponds to 2 PUR occasions, value e4 corresponds to 4 PUR occasions and so on. | |
| ***pur-NumOccasions***  Number of PUR occasions. Value *one* corresponds to 1 PUR occasion, and value *infinite* corresponds to an infinite number of PUR occasions. |
| ***pur-PDSCH-FreqHopping***  Frequency hopping activation/deactivation for PDSCH. See TS 36.213 [23]. | |
| ***pur-Periodicity***  Indicates the periodicity for the PUR occasions expressed as multiple of 10.24s. Value n8 indicates 8, value n16 inidcates 16 and so on. Actual value = indicated value \* 10.24s. | |
| ***pur-PUSCH-FreqHopping***  Frequency hopping activation/deactivation for PUSCH. See TS 36.213 [23]. | |
| ***pur-ResponseWindowTimer***  PUR 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. | |
| ***pur-RSRP-ChangeThreshold***  Indicates the threshold of change in serving cell RSRP in dB for TA validation. Value dB4 corresponds to 4 dB, value dB6 corresponds to 6 dB and so on. When *pur-RSRP-ChangeThreshold* is set to *setup*, if *rsrp-DecreaseThresh* is absent the value of *rsrp-IncreaseThresh* is also used for *rsrp-DecreaseThresh*. | |
| ***pur-StartTime***  Indicates the time gap with respect to current time until the first PUR occasion. Details FFS. | |
| ***pur-TimeAlignmentTimer***  Indicates the idle mode TA timer in seconds for TA validation. Actual value = indicated value \* *pur-Periodicity*. | |

<<unchanged text skipped>>

#### – *PUSCH-Config*

The IE *PUSCH-ConfigCommon* is used to specify the common PUSCH configuration and the reference signal configuration for PUSCH and PUCCH. The IE *PUSCH-ConfigDedicated* is used to specify the UE specific PUSCH configuration.

*PUSCH-Config* information element

-- ASN1START

PUSCH-ConfigCommon ::= SEQUENCE {

pusch-ConfigBasic SEQUENCE {

n-SB INTEGER (1..4),

hoppingMode ENUMERATED {interSubFrame, intraAndInterSubFrame},

pusch-HoppingOffset INTEGER (0..98),

enable64QAM BOOLEAN

},

ul-ReferenceSignalsPUSCH UL-ReferenceSignalsPUSCH

}

PUSCH-ConfigCommon-v1270 ::= SEQUENCE {

enable64QAM-v1270 ENUMERATED {true}

}

PUSCH-ConfigCommon-v1310 ::= SEQUENCE {

pusch-maxNumRepetitionCEmodeA-r13 ENUMERATED {

r8, r16, r32 } OPTIONAL, -- Need OR

pusch-maxNumRepetitionCEmodeB-r13 ENUMERATED {

r192, r256, r384, r512, r768, r1024,

r1536, r2048} OPTIONAL, -- Need OR

pusch-HoppingOffset-v1310

INTEGER (1..maxAvailNarrowBands-r13) OPTIONAL -- Need OR

}

PUSCH-ConfigDedicated ::= SEQUENCE {

betaOffset-ACK-Index INTEGER (0..15),

betaOffset-RI-Index INTEGER (0..15),

betaOffset-CQI-Index INTEGER (0..15)

}

PUSCH-ConfigDedicated-v1020 ::= SEQUENCE {

betaOffsetMC-r10 SEQUENCE {

betaOffset-ACK-Index-MC-r10 INTEGER (0..15),

betaOffset-RI-Index-MC-r10 INTEGER (0..15),

betaOffset-CQI-Index-MC-r10 INTEGER (0..15)

} OPTIONAL, -- Need OR

groupHoppingDisabled-r10 ENUMERATED {true} OPTIONAL, -- Need OR

dmrs-WithOCC-Activated-r10 ENUMERATED {true} OPTIONAL -- Need OR

}

PUSCH-ConfigDedicated-v1130 ::= SEQUENCE {

pusch-DMRS-r11 CHOICE {

release NULL,

setup SEQUENCE {

nPUSCH-Identity-r11 INTEGER (0..509),

nDMRS-CSH-Identity-r11 INTEGER (0..509)

}

}

}

PUSCH-ConfigDedicated-v1250::= SEQUENCE {

uciOnPUSCH CHOICE {

release NULL,

setup SEQUENCE {

betaOffset-ACK-Index-SubframeSet2-r12 INTEGER (0..15),

betaOffset-RI-Index-SubframeSet2-r12 INTEGER (0..15),

betaOffset-CQI-Index-SubframeSet2-r12 INTEGER (0..15),

betaOffsetMC-r12 SEQUENCE {

betaOffset-ACK-Index-MC-SubframeSet2-r12 INTEGER (0..15),

betaOffset-RI-Index-MC-SubframeSet2-r12 INTEGER (0..15),

betaOffset-CQI-Index-MC-SubframeSet2-r12 INTEGER (0..15)

} OPTIONAL -- Need OR

}

}

}

PUSCH-ConfigDedicated-r13 ::= SEQUENCE {

betaOffset-ACK-Index-r13 INTEGER (0..15),

betaOffset2-ACK-Index-r13 INTEGER (0..15) OPTIONAL, -- Need OR

betaOffset-RI-Index-r13 INTEGER (0..15),

betaOffset-CQI-Index-r13 INTEGER (0..15),

betaOffsetMC-r13 SEQUENCE {

betaOffset-ACK-Index-MC-r13 INTEGER (0..15),

betaOffset2-ACK-Index-MC-r13 INTEGER (0..15) OPTIONAL, -- Need OR

betaOffset-RI-Index-MC-r13 INTEGER (0..15),

betaOffset-CQI-Index-MC-r13 INTEGER (0..15)

} OPTIONAL, -- Need OR

groupHoppingDisabled-r13 ENUMERATED {true} OPTIONAL, -- Need OR

dmrs-WithOCC-Activated-r13 ENUMERATED {true} OPTIONAL, -- Need OR

pusch-DMRS-r11 CHOICE {

release NULL,

setup SEQUENCE {

nPUSCH-Identity-r13 INTEGER (0..509),

nDMRS-CSH-Identity-r13 INTEGER (0..509)

}

} OPTIONAL, -- Need ON

uciOnPUSCH CHOICE {

release NULL,

setup SEQUENCE {

betaOffset-ACK-Index-SubframeSet2-r13 INTEGER (0..15),

betaOffset2-ACK-Index-SubframeSet2-r13 INTEGER (0..15) OPTIONAL, -- Need OR

betaOffset-RI-Index-SubframeSet2-r13 INTEGER (0..15),

betaOffset-CQI-Index-SubframeSet2-r13 INTEGER (0..15),

betaOffsetMC-r12 SEQUENCE {

betaOffset-ACK-Index-MC-SubframeSet2-r13 INTEGER (0..15),

betaOffset2-ACK-Index-MC-SubframeSet2-r13 INTEGER (0..15) OPTIONAL, -- Need OR

betaOffset-RI-Index-MC-SubframeSet2-r13 INTEGER (0..15),

betaOffset-CQI-Index-MC-SubframeSet2-r13 INTEGER (0..15)

} OPTIONAL -- Need OR

}

} OPTIONAL, -- Need ON

pusch-HoppingConfig-r13 ENUMERATED {on} OPTIONAL -- Need OR

}

PUSCH-ConfigDedicated-v1430 ::= SEQUENCE {

ce-PUSCH-NB-MaxTBS-r14 ENUMERATED {on} OPTIONAL, -- Need OR

ce-PUSCH-MaxBandwidth-r14 ENUMERATED {bw5} OPTIONAL, -- Need OR

tdd-PUSCH-UpPTS-r14 TDD-PUSCH-UpPTS-r14 OPTIONAL, -- Need ON

ul-DMRS-IFDMA-r14 BOOLEAN,

enable256QAM-r14 Enable256QAM-r14 OPTIONAL -- Need ON

}

PUSCH-ConfigDedicated-v1530 ::= SEQUENCE {

ce-PUSCH-FlexibleStartPRB-AllocConfig-r15 CHOICE {

release NULL,

setup SEQUENCE {

offsetCE-ModeB-r15 INTEGER (-1..3) OPTIONAL -- Cond CE-ModeB

}

},

ce-PUSCH-SubPRB-Config-r15 CHOICE {

release NULL,

setup SEQUENCE {

locationCE-ModeB-r15 INTEGER (0..5) OPTIONAL, -- Cond CE-ModeB

sixToneCyclicShift-r15 INTEGER (0..3),

threeToneCyclicShift-r15 INTEGER (0..2)

}

} OPTIONAL -- Need ON

}

PUSCH-ConfigDedicated-v16xy ::= SEQUENCE {

ce-PUSCH-MultiTB-Config-r16 SetupRelease {CE-PUSCH-MultiTB-Config-r16}

}

PUSCH-ConfigDedicatedSCell-r10 ::= SEQUENCE {

groupHoppingDisabled-r10 ENUMERATED {true} OPTIONAL, -- Need OR

dmrs-WithOCC-Activated-r10 ENUMERATED {true} OPTIONAL -- Need OR

}

PUSCH-ConfigDedicatedSCell-v1430 ::= SEQUENCE {

enable256QAM-r14 Enable256QAM-r14 OPTIONAL -- Need OR

}

PUSCH-ConfigDedicatedScell-v1530 ::= SEQUENCE {

uci-OnPUSCH-r15 CHOICE {

release NULL,

setup SEQUENCE {

betaOffsetAUL-r15 INTEGER (0..15)

}

}

}

CE-PUSCH-MultiTB-Config-r16 ::= SEQUENCE {

interleaving-r16 ENUMERATED {on} OPTIONAL -- Need OR

}

TDD-PUSCH-UpPTS-r14 ::= CHOICE {

release NULL,

setup SEQUENCE {

symPUSCH-UpPTS-r14 ENUMERATED {sym1, sym2, sym3, sym4, sym5, sym6} OPTIONAL, -- Need ON

dmrs-LessUpPTS-Config-r14 ENUMERATED {true} OPTIONAL -- Need OR

}

}

Enable256QAM-r14 ::= CHOICE {

release NULL,

setup CHOICE {

tpc-SubframeSet-Configured-r14 SEQUENCE {

subframeSet1-DCI-Format0-r14 BOOLEAN,

subframeSet1-DCI-Format4-r14 BOOLEAN,

subframeSet2-DCI-Format0-r14 BOOLEAN,

subframeSet2-DCI-Format4-r14 BOOLEAN

},

tpc-SubframeSet-NotConfigured-r14 SEQUENCE {

dci-Format0-r14 BOOLEAN,

dci-Format4-r14 BOOLEAN

}

}

}

PUSCH-EnhancementsConfig-r14 ::= CHOICE {

release NULL,

setup SEQUENCE {

pusch-HoppingOffsetPUSCH-Enh-r14 INTEGER (1..100) OPTIONAL, -- Need ON

interval-ULHoppingPUSCH-Enh-r14 CHOICE {

interval-FDD-PUSCH-Enh-r14 ENUMERATED {int1, int2, int4, int8},

interval-TDD-PUSCH-Enh-r14 ENUMERATED {int1, int5, int10, int20}

} OPTIONAL -- Need ON

}

}

UL-ReferenceSignalsPUSCH ::= SEQUENCE {

groupHoppingEnabled BOOLEAN,

groupAssignmentPUSCH INTEGER (0..29),

sequenceHoppingEnabled BOOLEAN,

cyclicShift INTEGER (0..7)

}

-- ASN1STOP

| *PUSCH-Config* field descriptions |
| --- |
| ***betaOffset-ACK-Index, betaOffset2-ACK-Index, betaOffset-ACK-Index-MC, betaOffset2-ACK-Index-MC***  Parameter: ,, and , for single- and multiple-codeword respectively, see TS 36.213 [23], Table 8.6.3-1. *betaOffset-ACK-Index* and *betaOffset2-ACK-Index* are used for single-codeword and *betaOffset-ACK-Index-MC* and *betaOffset2-ACK-Index-MC* are used for multiple-codeword. If *betaOffset2-ACK-Index* is configured; *betaOffset-ACK-Index* is used when up to 22 HARQ-ACK bits are transmitted otherwise *betaOffset2-ACK-Index* is used. If *betaOffset-ACK2-Index-MC* is configured; *betaOffset-ACK-Index-MC* is used when up to 22 HARQ-ACK bits are transmitted otherwise *betaOffset2-ACK-Index-MC* is used. One value applies for all serving cells with an uplink in a cell group (MCG or SCG or the group of cells configured to send PUCCH on the same cell in case PUCCH SCell is configured) and not configured with uplink power control subframe sets. The same value also applies for subframe set 1 of all serving cells with an uplink in that cell group and configured with uplink power control subframe sets (the associated functionality is common i.e. not performed independently for each cell). |
| ***betaOffset-ACK-Index-SubframeSet2, betaOffset2-ACK-Index-SubframeSet2, betaOffset-ACK-Index-MC-SubframeSet2, betaOffset2-ACK-Index-MC-SubframeSet2***  Parameter: ,,and respectively, see TS 36.213 [23], Table 8.6.3-1. *betaOffset-ACK-Index-SubframeSet2* and *betaOffset2-ACK-Index-SubframeSet2* are used for single-codeword*, betaOffset-ACK-Index-MC-SubframeSet2*, *betaOffset2-ACK-Index-MC-SubframeSet2* are used for multiple-codeword. If *betaOffset2-ACK-Index-SubframeSet2* is configured; *betaOffset-ACK-Index-SubframeSet2* is used when up to 22 HARQ-ACK bits are transmitted otherwise *betaOffset2-ACK-Index-SubframeSet2* is used. If *betaOffset2-ACK-Index-MC-SubframeSet2* is configured; *betaOffset-ACK-Index-MC-SubframeSet2* is used when up to 22 HARQ-ACK bits are transmitted otherwise *betaOffset2-ACK-Index-MC-SubframeSet2* is used. One value applies for subframe set 2 of all serving cells with an uplink in a cell group (MCG or SCG or the group of cells configured to send PUCCH on the same cell in case PUCCH SCell is configured) and configured with uplink power control subframe sets (the associated functionality is common i.e. not performed independently for each cell configured with uplink power control subframe sets). |
| ***betaOffsetAUL***  Parameter: cid:image001.png@01D3E2C5.4F0A8300 see TS 36.213 [23], clause 8.6.3. |
| ***betaOffset-CQI-Index, betaOffset-CQI-Index-MC***  Parameter: , for single- and multiple-codeword respectively, see TS 36.213 [23], Table 8.6.3-3. One value applies for all serving cells with an uplink in a cell group (MCG or SCG or the group of cells configured to send PUCCH on the same cell in case PUCCH SCell is configured) and not configured with uplink power control subframe sets. The same value also applies for subframe set 1 of all serving cells with an uplink in that cell group and configured with uplink power control subframe sets (the associated functionality is common i.e. not performed independently for each cell). |
| ***betaOffset-CQI-Index-SubframeSet2, betaOffset-CQI-Index-MC-SubframeSet2***  Parameter: , for single- and multiple-codeword respectively, see TS 36.213 [23], Table 8.6.3-3. One value applies for subframe set 2 of all serving cells with an uplink in a cell group (MCG or SCG or the group of cells configured to send PUCCH on the same cell in case PUCCH SCell is configured) and configured with uplink power control subframe sets (the associated functionality is common i.e. not performed independently for each cell configured with uplink power control subframe sets). |
| ***betaOffset-RI-Index, betaOffset-RI-Index-MC***  Parameter: , for single- and multiple-codeword respectively, see TS 36.213 [23], Table 8.6.3-2. One value applies for all serving cells with an uplink in a cell group (MCG or SCG or the group of cells configured to send PUCCH on the same cell in case PUCCH SCell is configured) and not configured with uplink power control subframe sets. The same value also applies for subframe set 1 of all serving cells with an uplink in that cell group and configured with uplink power control subframe sets (the associated functionality is common i.e. not performed independently for each cell). |
| ***betaOffset-RI-Index-SubframeSet2, betaOffset-RI-Index-MC-SubframeSet2***  Parameter: , for single- and multiple-codeword respectively, see TS 36.213 [23], Table 8.6.3-2. One value applies for subframe set 2 of all serving cells with an uplink in a cell group (MCG or SCG or the group of cells configured to send PUCCH on the same cell in case PUCCH SCell is configured) and configured with uplink power control subframe sets (the associated functionality is common i.e. not performed independently for each cell configured with uplink power control subframe sets). |
| ***ce-PUSCH-FlexibleStartPRB-AllocConfig***  Activation of flexible starting PRB for PUSCH resource allocation in CE mode A or B. *offsetCE-ModeB* indicates starting PRB offset when flexible starting PRB for PUSCH resource allocation in CE mode B is enabled. See TS 36.212 [22] and TS 36.213 [23]. E-UTRAN does not configure this field when E-UTRA system bandwidth is 1.4 MHz. |
| ***ce-PUSCH-MaxBandwidth***  Maximum PUSCH channel bandwidth in CE mode A, see TS 36.212 [22] and TS 36.213 [23]. Value bw5 corresponds to 5 MHz. If this field is not configured, the maximum PUSCH channel bandwidth in CE mode A set to 1.4 MHz. The maximum PUSCH channel bandwidth in CE mode B is 1.4 MHz regardless of the setting of this parameter. Parameter: transmission bandwidth configuration, see TS 36.101 [42], table 5.6-1. |
| ***ce-PUSCH-MultiTB-Config***  Indicates whether UL multi-TB scheduling is enabled, i.e., a single DCI can schedule up to 8 PUSCH transport blocks in CE mode A and up to 4 PUSCH transport blocks in CE mode B. See TS 36.213 [23], clause 8.0. | |
|  | |
| ***ce-PUSCH-NB-MaxTBS***  Activation of 2984 bits maximum PUSCH TBS in 1.4 MHz in CE mode A, see TS 36.212 [22] and TS 36.213 [23]. |
| ***ce-PUSCH-SubPRB-Config***  Activation of PUSCH sub-PRB allocation in CE mode A or B, see TS 36.211 [21], TS 36.212 [22] and TS 36.213 [23]. |
| ***cyclicShift***  Parameters: *cyclicShift*, *s*ee TS 36.211 [21], Table 5.5.2.1.1-2. |
| ***dmrs-LessUpPTS-Config***  Indicates the UE not to transmit DMRS for PUSCH in UpPTS, see TS36.211 [21], clause 5.5.2.1.2. |
| ***dmrs-WithOCC-Activated***  Parameter: *Activate-DMRS-with OCC*, see TS 36.211 [21], clause 5.5.2.1. |
| ***enable256QAM***  See TS 36.213 [23], clause 8.6.1. If *enable256QAM* is included and if uplink power control subframe sets are configured by *tpc-SubframeSet*, the field indicates (if set to TRUE) per uplink power control subframe set and DCI format 0/0A/0B and 4/4A/4B that 256QAM is allowed for UE UL categories 16 to 20 indicated in *ue-CategoryUL-v1430,* while FALSE indicates that 256 QAM is not allowed. If *enable256QAM* is included and if uplink power control subframe sets are not configured by *tpc-SubframeSet,* the field indicates (if set to TRUE) per DCI format 0/0A/0B and 4/4A/4B that 256QAM is allowed for UE UL categories 16 to 20 indicated in *ue-CategoryUL-v1430,* while FALSE indicates that 256 QAM is not allowed. |
| ***enable64QAM***  See TS 36.213 [23], clause 8.6.1. If *enable64QAM* (without suffix) is set to TRUE, it indicates that 64QAM is allowed for UE categories 5 and 8 indicated in *ue-Category* and UL categories indicated in *ue-CategoryUL* which support UL 64QAM and can fallback to category 5 or 8, see TS 36.306 [5], Table 4.1A-2 and Table 4.1A-6, while FALSE indicates that 64QAM is not allowed. If *enable64QAM-v1270* is set to TRUE, it indicates that 64QAM is allowed for UL categories indicated in *ue-CategoryUL* which support UL 64QAM but cannot fallback category 5 or 8, see TS 36.306 [5], Table 4.1A-2 and Table 4.1A-6. E-UTRAN configures *enable64QAM-v1270* only when *enable64QAM* (without suffix) is set to TRUE. |
| ***i*** | |
| ***interval-ULHoppingPUSCH-Enh***  Number of consecutive absolute subframes over which PUSCH stays at the same PRBs before hopping to other PRBs. For *interval-FDD-PUSCH-Enh*, int1 corresponds to 1 subframe, int2 corresponds to 2 subframes, and so on. For *interval-TDD-PUSCH-Enh*, int1 corresponds to 1 subframe, int5 corresponds to 5 subframes, and so on. See TS 36.211 [21], clause 5.3.4. |
| ***groupAssignmentPUSCH***  Parameter: *ΔSS* See TS 36.211 [21], clause 5.5.1.3. |
| ***groupHoppingDisabled***  Parameter: *Disable-sequence-group-hopping*, see TS 36.211 [21], clause 5.5.1.3. |
| ***groupHoppingEnabled***  Parameter: *Group-hopping-enabled*, see TS 36.211 [21], clause 5.5.1.3. |
| ***hoppingMode***  Parameter: *Hopping-mode*, see TS 36.211 [21], clause 5.3.4. |
| ***locationCE-ModeB***  PRB location within the narrowband when PUSCH sub-PRB allocation is enabled in CE mode B. |
| ***nDMRS-CSH-Identity***  Parameter: , see TS 36.211 [21], clause 5.5.2.1.1. |
| ***nPUSCH-Identity***  Parameter: , see TS 36.211 [21], clause 5.5.1.5. |
| ***n-SB***  Parameter: Nsb see TS 36.211 [21], clause 5.3.4. |
| ***pusch-HoppingConfig***  For BL UEs and UEs in CE, frequency hopping activation/deactivation for unicast PUSCH, see TS 36.211 [21] |
| ***pusch-hoppingOffset***  Except for BL UEs and UEs in CE, parameter: , see TS 36.211 [21], clause 5.3.4. For BL UEs and UEs in CE, the *pusch-hoppingOffset-v1310* indicates the parameter, see TS 36.211 [21], clause 5.3.4. . In case *pusch-hoppingOffset-v1310* is signalled, the BL UEs and UEs in CE shall ignore *pusch-hoppingOffset* (i.e. without suffix). |
| ***pusch-HoppingOffsetPUSCH-Enh***  Indicates the freqeuncy domain hopping offset between PRBs for PUSCH in frequency hopping, see TS 36.211 [21], clause 5.3.4. Value 1 corresponds to 1 PRB, value 2 corresponds to 2 PRBs, and so on. |
| ***pusch-maxNumRepetitionCEmodeA***  Maximum value to indicate the set of PUSCH repetition numbers for CE mode A, see TS 36.211 [21] and TS 36.213 [23]. E-UTRAN does not configure value r8. If the field is not configured, the UE shall apply the default value as defined in TS 36.213 [23], clause 8.0. |
| ***pusch-maxNumRepetitionCEmodeB***  Maximum value to indicate the set of PUSCH repetition numbers for CE mode B, see TS 36.211 [21] and TS 36.213 [23]. |
| ***sequenceHoppingEnabled***  Parameter: *Sequence-hopping-enabled*, see TS 36.211 [21], clause 5.5.1.4. |
| ***sixToneCyclicShift, threeToneCyclicShift***  Cyclic shift for PUSCH reference signal sequence of six/three subcarriers in CE mode A or B. |
| ***symPUSCH-UpPTS***  Indicates the number of data symbols that configured for PUSCH transmission in UpPTS. Values *sym2*, *sym3*, *sym4*, *sym5* and *sym6* can be used for normal cyclic prefix, if *dmrsLess-UpPTS* is set to *true*, otherwise, values *sym2, sym3, sym4,* *sym5* can be used for normal cyclic prefix and values *sym1*, *sym2*, *sym3* and *sym4* can be used for extended cyclic prefix, see TS 36.213 [23], clause 8.6.2 and TS 36.211 [21], clause 5.3.4. |
| ***ul-DMRS-IFDMA***  Value *TRUE* indicates that the UE is configured with enhanced UL DMRS. |
| ***ul-ReferenceSignalsPUSCH***  Used to specify parameters needed for the transmission on PUSCH (or PUCCH). |

| Conditional presence | Explanation |
| --- | --- |
| *CE-ModeB* | The field is optionally present, need ON, for CE Mode B. Otherwise, the field is not present. |

#### – *RadioResourceConfigCommon*

The IE *RadioResourceConfigCommonSIB* and IE *RadioResourceConfigCommon* are used to specify common radio resource configurations in the system information and in the mobility control information, respectively, e.g., the random access parameters and the static physical layer parameters.

*RadioResourceConfigCommon* information element

-- ASN1START

RadioResourceConfigCommonSIB ::= SEQUENCE {

rach-ConfigCommon RACH-ConfigCommon,

bcch-Config BCCH-Config,

pcch-Config PCCH-Config,

prach-Config PRACH-ConfigSIB,

pdsch-ConfigCommon PDSCH-ConfigCommon,

pusch-ConfigCommon PUSCH-ConfigCommon,

pucch-ConfigCommon PUCCH-ConfigCommon,

soundingRS-UL-ConfigCommon SoundingRS-UL-ConfigCommon,

uplinkPowerControlCommon UplinkPowerControlCommon,

ul-CyclicPrefixLength UL-CyclicPrefixLength,

...,

[[ uplinkPowerControlCommon-v1020 UplinkPowerControlCommon-v1020 OPTIONAL -- Need OR

]],

[[ rach-ConfigCommon-v1250 RACH-ConfigCommon-v1250 OPTIONAL -- Need OR

]],

[[ pusch-ConfigCommon-v1270 PUSCH-ConfigCommon-v1270 OPTIONAL -- Need OR

]],

[[ bcch-Config-v1310 BCCH-Config-v1310 OPTIONAL, -- Need OR

pcch-Config-v1310 PCCH-Config-v1310 OPTIONAL, -- Need OR

freqHoppingParameters-r13 FreqHoppingParameters-r13 OPTIONAL, -- Need OR

pdsch-ConfigCommon-v1310 PDSCH-ConfigCommon-v1310 OPTIONAL, -- Need OR

pusch-ConfigCommon-v1310 PUSCH-ConfigCommon-v1310 OPTIONAL, -- Need OR

prach-ConfigCommon-v1310 PRACH-ConfigSIB-v1310 OPTIONAL, -- Need OR

pucch-ConfigCommon-v1310 PUCCH-ConfigCommon-v1310 OPTIONAL -- Need OR

]],

[[ highSpeedConfig-r14 HighSpeedConfig-r14 OPTIONAL, -- Need OR

prach-Config-v1430 PRACH-Config-v1430 OPTIONAL, -- Need OR

pucch-ConfigCommon-v1430 PUCCH-ConfigCommon-v1430 OPTIONAL -- Need OR

]],

[[ prach-Config-v1530 PRACH-ConfigSIB-v1530 OPTIONAL, -- Cond EDT

ce-RSS-Config-r15 RSS-Config-r15 OPTIONAL, -- Need OR

wus-Config-r15 WUS-Config-r15 OPTIONAL, -- Need OR

highSpeedConfig-v1530 HighSpeedConfig-v1530 OPTIONAL -- Need OR

]],

[[ uplinkPowerControlCommon-v1540 UplinkPowerControlCommon-v1530 OPTIONAL -- Need OR

]],

[[ wus-Config-v1560 WUS-Config-v1560 OPTIONAL -- Need OR

]],

[[ highSpeedConfig-v16xy HighSpeedConfig-v16xy OPTIONAL, -- Need OR

crs-ChEstMPDCCH-ConfigCommon-r16 CRS-ChEstMPDCCH-ConfigCommon-r16 OPTIONAL, -- Need OR

wus-Config-v16xy WUS-Config-v16xy OPTIONAL, -- Need OR

gwus-Config-r16 GWUS-Config-r16 OPTIONAL, -- Need OR

uplinkPowerControlCommon-v16xy UplinkPowerControlCommon-v16xy OPTIONAL, -- Need OR

rss-MeasConfig-r16 ENUMERATED {enabled} OPTIONAL, -- Need OR

rss-MeasNonNCL-r16 ENUMERATED {enabled} OPTIONAL -- Need OR

]]

}

RadioResourceConfigCommon ::= SEQUENCE {

rach-ConfigCommon RACH-ConfigCommon OPTIONAL, -- Need ON

prach-Config PRACH-Config,

pdsch-ConfigCommon PDSCH-ConfigCommon OPTIONAL, -- Need ON

pusch-ConfigCommon PUSCH-ConfigCommon,

phich-Config PHICH-Config OPTIONAL, -- Need ON

pucch-ConfigCommon PUCCH-ConfigCommon OPTIONAL, -- Need ON

soundingRS-UL-ConfigCommon SoundingRS-UL-ConfigCommon OPTIONAL, -- Need ON

uplinkPowerControlCommon UplinkPowerControlCommon OPTIONAL, -- Need ON

antennaInfoCommon AntennaInfoCommon OPTIONAL, -- Need ON

p-Max P-Max OPTIONAL, -- Need OP

tdd-Config TDD-Config OPTIONAL, -- Cond TDD

ul-CyclicPrefixLength UL-CyclicPrefixLength,

...,

[[ uplinkPowerControlCommon-v1020 UplinkPowerControlCommon-v1020 OPTIONAL -- Need ON

]],

[[ tdd-Config-v1130 TDD-Config-v1130 OPTIONAL -- Cond TDD3

]],

[[ pusch-ConfigCommon-v1270 PUSCH-ConfigCommon-v1270 OPTIONAL -- Need OR

]],

[[

prach-Config-v1310 PRACH-Config-v1310 OPTIONAL, -- Need ON

freqHoppingParameters-r13 FreqHoppingParameters-r13 OPTIONAL, -- Need ON

pdsch-ConfigCommon-v1310 PDSCH-ConfigCommon-v1310 OPTIONAL, -- Need ON

pucch-ConfigCommon-v1310 PUCCH-ConfigCommon-v1310 OPTIONAL, -- Need ON

pusch-ConfigCommon-v1310 PUSCH-ConfigCommon-v1310 OPTIONAL, -- Need ON

uplinkPowerControlCommon-v1310 UplinkPowerControlCommon-v1310 OPTIONAL -- Need ON

]],

[[ highSpeedConfig-r14 HighSpeedConfig-r14 OPTIONAL, -- Need OR

prach-Config-v1430 PRACH-Config-v1430 OPTIONAL, -- Need OR

pucch-ConfigCommon-v1430 PUCCH-ConfigCommon-v1430 OPTIONAL, -- Need OR

tdd-Config-v1430 TDD-Config-v1430 OPTIONAL -- Cond TDD3

]],

[[

tdd-Config-v1450 TDD-Config-v1450 OPTIONAL -- Cond TDD3

]],

[[ uplinkPowerControlCommon-v1530 UplinkPowerControlCommon-v1530 OPTIONAL, -- Need ON

highSpeedConfig-v1530 HighSpeedConfig-v1530 OPTIONAL -- Need OR

]],

[[

highSpeedConfig-v16xy HighSpeedConfig-v16xy OPTIONAL, -- Need OR

uplinkPowerControlCommon-v16xy UplinkPowerControlCommon-v16xy OPTIONAL -- Need OR

]]

}

RadioResourceConfigCommonPSCell-r12 ::= SEQUENCE {

basicFields-r12 RadioResourceConfigCommonSCell-r10,

pucch-ConfigCommon-r12 PUCCH-ConfigCommon,

rach-ConfigCommon-r12 RACH-ConfigCommon,

uplinkPowerControlCommonPSCell-r12 UplinkPowerControlCommonPSCell-r12,

...,

[[ uplinkPowerControlCommonPSCell-v1310

UplinkPowerControlCommon-v1310 OPTIONAL -- Need ON

]],

[[ uplinkPowerControlCommonPSCell-v1530

UplinkPowerControlCommon-v1530 OPTIONAL -- Need ON

]]

}

RadioResourceConfigCommonPSCell-v12f0 ::= SEQUENCE {

basicFields-v12f0 RadioResourceConfigCommonSCell-v10l0

}

RadioResourceConfigCommonPSCell-v1440 ::= SEQUENCE {

basicFields-v1440 RadioResourceConfigCommonSCell-v1440

}

RadioResourceConfigCommonSCell-r10 ::= SEQUENCE {

-- DL configuration as well as configuration applicable for DL and UL

nonUL-Configuration-r10 SEQUENCE {

-- 1: Cell characteristics

dl-Bandwidth-r10 ENUMERATED {n6, n15, n25, n50, n75, n100},

-- 2: Physical configuration, general

antennaInfoCommon-r10 AntennaInfoCommon,

mbsfn-SubframeConfigList-r10 MBSFN-SubframeConfigList OPTIONAL, -- Need OR

-- 3: Physical configuration, control

phich-Config-r10 PHICH-Config,

-- 4: Physical configuration, physical channels

pdsch-ConfigCommon-r10 PDSCH-ConfigCommon,

tdd-Config-r10 TDD-Config OPTIONAL -- Cond TDDSCell

},

-- UL configuration

ul-Configuration-r10 SEQUENCE {

ul-FreqInfo-r10 SEQUENCE {

ul-CarrierFreq-r10 ARFCN-ValueEUTRA OPTIONAL, -- Need OP

ul-Bandwidth-r10 ENUMERATED {n6, n15,

n25, n50, n75, n100} OPTIONAL, -- Need OP

additionalSpectrumEmissionSCell-r10 AdditionalSpectrumEmission

},

p-Max-r10 P-Max OPTIONAL, -- Need OP

uplinkPowerControlCommonSCell-r10 UplinkPowerControlCommonSCell-r10,

-- A special version of IE UplinkPowerControlCommon may be introduced

-- 3: Physical configuration, control

soundingRS-UL-ConfigCommon-r10 SoundingRS-UL-ConfigCommon,

ul-CyclicPrefixLength-r10 UL-CyclicPrefixLength,

-- 4: Physical configuration, physical channels

prach-ConfigSCell-r10 PRACH-ConfigSCell-r10 OPTIONAL, -- Cond TDD-OR-NoR11

pusch-ConfigCommon-r10 PUSCH-ConfigCommon

} OPTIONAL, -- Need OR

...,

[[ ul-CarrierFreq-v1090 ARFCN-ValueEUTRA-v9e0 OPTIONAL -- Need OP

]],

[[ rach-ConfigCommonSCell-r11 RACH-ConfigCommonSCell-r11 OPTIONAL, -- Cond ULSCell

prach-ConfigSCell-r11 PRACH-Config OPTIONAL, -- Cond UL

tdd-Config-v1130 TDD-Config-v1130 OPTIONAL, -- Cond TDD2

uplinkPowerControlCommonSCell-v1130

UplinkPowerControlCommonSCell-v1130 OPTIONAL -- Cond UL

]],

[[ pusch-ConfigCommon-v1270 PUSCH-ConfigCommon-v1270 OPTIONAL -- Need OR

]],

[[ pucch-ConfigCommon-r13 PUCCH-ConfigCommon OPTIONAL, -- Cond UL

uplinkPowerControlCommonSCell-v1310

UplinkPowerControlCommonSCell-v1310 OPTIONAL -- Cond UL

]],

[[ highSpeedConfigSCell-r14 HighSpeedConfigSCell-r14 OPTIONAL, -- Need OR

prach-Config-v1430 PRACH-Config-v1430 OPTIONAL, -- Cond UL

ul-Configuration-r14 SEQUENCE {

ul-FreqInfo-r14 SEQUENCE {

ul-CarrierFreq-r14 ARFCN-ValueEUTRA-r9 OPTIONAL, -- Need OP

ul-Bandwidth-r14 ENUMERATED {n6, n15,

n25, n50, n75, n100} OPTIONAL, -- Need OP

additionalSpectrumEmissionSCell-r14 AdditionalSpectrumEmission

},

p-Max-r14 P-Max OPTIONAL, -- Need OP

soundingRS-UL-ConfigCommon-r14 SoundingRS-UL-ConfigCommon,

ul-CyclicPrefixLength-r14 UL-CyclicPrefixLength,

prach-ConfigSCell-r14 PRACH-ConfigSCell-r10 OPTIONAL, -- Cond TDD-OR-NoR11

uplinkPowerControlCommonPUSCH-LessCell-v1430

UplinkPowerControlCommonPUSCH-LessCell-v1430 OPTIONAL -- Need OR

} OPTIONAL, -- Cond ULSRS

harq-ReferenceConfig-r14 ENUMERATED {sa2,sa4,sa5} OPTIONAL, -- Need OR

soundingRS-FlexibleTiming-r14 ENUMERATED {true} OPTIONAL -- Need OR

]],

[[ mbsfn-SubframeConfigList-v1430 MBSFN-SubframeConfigList-v1430 OPTIONAL -- Need ON

]],

[[ uplinkPowerControlCommonSCell-v1530 UplinkPowerControlCommon-v1530 OPTIONAL -- Need ON

]],

[[

highSpeedConfigSCell-v16xy HighSpeedConfigSCell-v16xy OPTIONAL -- Need OR

]]

}

RadioResourceConfigCommonSCell-v10l0 ::= SEQUENCE {

-- UL configuration

ul-Configuration-v10l0 SEQUENCE {

additionalSpectrumEmissionSCell-v10l0 AdditionalSpectrumEmission-v10l0

}

}

RadioResourceConfigCommonSCell-v1440 ::= SEQUENCE {

ul-Configuration-v1440 SEQUENCE {

ul-FreqInfo-v1440 SEQUENCE {

additionalSpectrumEmissionSCell-v1440 AdditionalSpectrumEmission-v10l0

}

}

}

BCCH-Config ::= SEQUENCE {

modificationPeriodCoeff ENUMERATED {n2, n4, n8, n16}

}

BCCH-Config-v1310 ::= SEQUENCE {

modificationPeriodCoeff-v1310 ENUMERATED {n64}

}

FreqHoppingParameters-r13 ::= SEQUENCE {

dummy ENUMERATED {nb2, nb4} OPTIONAL,

dummy2 CHOICE {

interval-FDD-r13 ENUMERATED {int1, int2, int4, int8},

interval-TDD-r13 ENUMERATED {int1, int5, int10, int20}

} OPTIONAL,

dummy3 CHOICE {

interval-FDD-r13 ENUMERATED {int2, int4, int8, int16},

interval-TDD-r13 ENUMERATED { int5, int10, int20, int40}

} OPTIONAL,

interval-ULHoppingConfigCommonModeA-r13 CHOICE {

interval-FDD-r13 ENUMERATED {int1, int2, int4, int8},

interval-TDD-r13 ENUMERATED {int1, int5, int10, int20}

} OPTIONAL, -- Cond MP-A

interval-ULHoppingConfigCommonModeB-r13 CHOICE {

interval-FDD-r13 ENUMERATED {int2, int4, int8, int16},

interval-TDD-r13 ENUMERATED { int5, int10, int20, int40}

} OPTIONAL, -- Cond MP-B

dummy4 INTEGER (1..maxAvailNarrowBands-r13) OPTIONAL

}

PCCH-Config ::= SEQUENCE {

defaultPagingCycle ENUMERATED {

rf32, rf64, rf128, rf256},

nB ENUMERATED {

fourT, twoT, oneT, halfT, quarterT, oneEighthT,

oneSixteenthT, oneThirtySecondT}

}

PCCH-Config-v1310 ::= SEQUENCE {

paging-narrowBands-r13 INTEGER (1..maxAvailNarrowBands-r13),

mpdcch-NumRepetition-Paging-r13 ENUMERATED {r1, r2, r4, r8, r16, r32, r64, r128, r256},

nB-v1310 ENUMERATED {one64thT, one128thT, one256thT}

OPTIONAL -- Need OR

}

UL-CyclicPrefixLength ::= ENUMERATED {len1, len2}

HighSpeedConfig-r14 ::= SEQUENCE {

highSpeedEnhancedMeasFlag-r14 ENUMERATED {true} OPTIONAL, -- Need OR

highSpeedEnhancedDemodulationFlag-r14 ENUMERATED {true} OPTIONAL -- Need OR

}

HighSpeedConfig-v1530 ::= SEQUENCE {

highSpeedMeasGapCE-ModeA-r15 ENUMERATED {true}

}

HighSpeedConfigSCell-r14 ::= SEQUENCE {

highSpeedEnhancedDemodulationFlag-r14 ENUMERATED {true} OPTIONAL -- Need OR

}

HighSpeedConfig-v16xy ::= SEQUENCE {

highSpeedEnhMeasFlag2-r16 ENUMERATED {true} OPTIONAL, -- Need OR

highSpeedEnhDemodFlag2-r16 ENUMERATED {true} OPTIONAL -- Need OR

}

HighSpeedConfigSCell-v16xy ::= SEQUENCE {

highSpeedEnhMeasFlagSCell-r16 ENUMERATED {true}

}

-- ASN1STOP

| *RadioResourceConfigCommon* field descriptions |
| --- |
| ***additionalSpectrumEmissionSCell***  The UE requirements related to *additionalSpectrumEmissionSCell* are defined in TS 36.101 [42]. E-UTRAN configures the same value in *additionalSpectrumEmissionSCell* for all SCell(s) of the same band with UL configured. The *additionalSpectrumEmissionSCell* is applicable for all serving cells (including PCell) of the same band with UL configured. |
| ***crs-ChEstMPDCCH-ConfigCommon***  Presence of this field indicates use of CRS for improving channel estimation on MPDCCH is enabled in RRC\_IDLE and RRC\_CONNECTED mode for UEs indicating support of *ce-CRS-ChannelEstMPDCCH*. |
| ***defaultPagingCycle***  Default paging cycle, used to derive 'T' in TS 36.304 [4]. Value rf32 corresponds to 32 radio frames, rf64 corresponds to 64 radio frames and so on. |
| ***dummy***  This field is not used in the specification. If received it shall be ignored by the UE. |
| ***harq-ReferenceConfig***  Indicates UL/ DL configuration used as the DL HARQ reference configuration for this serving cell. Value sa2 corresponds to Configuration2, sa4 to Configuration4 etc, as specified in TS 36.211 [21], table 4.2-2. E-UTRAN configures the same value for all serving cells residing on same frequency band. |
| ***highSpeedEnhancedMeasFlag***  If the field is present, the UE shall apply the high speed (350 km/h) measurement enhancements as specified in TS 36.133 [16]. If *highSpeedEnhMeasFlag2* is present, the UE indicating *measurementEnhancements2* shall ignore this field. |
| ***highSpeedEnhancedDemodulationFlag***  If the field is present, the UE shall apply the advanced receiver in SFN scenario (350 km/h) as specified in TS 36.101 [42]. If this field is included in *HighSpeedConfig* and *highSpeedEnhDemodFlag2* is present, the UE indicating *demodulationEnhancements2* shall ignore this field in *HighSpeedConfig*. |
| ***highSpeedEnhDemodFlag2***  If the field is present, the UE shall apply the further enhanced receiver in HST-SFN scenario (500 km/h) as specified in TS 36.101 [42]. |
| ***highSpeedEnhMeasFlag2***  If the field is present, the UE shall apply the high speed (500 km/h) measurement enhancements as specified in TS 36.133 [16]. |
| ***highSpeedEnhMeasFlagSCell***  If the field is present, the UE shall apply the high speed (350 km/h) SCell measurement enhancements as specified in TS 36.133 [16]. |
| ***highSpeedMeasGapCE-ModeA***  If the field is present, the UE in CE mode A shall apply the measurement gap sharing table associated with high-velocity scenario for measurements, as specified in TS 36.133 [16]. |
| ***interval-DLHoppingConfigCommonModeX***  Number of consecutive absolute subframes over which MPDCCH or PDSCH for CE mode X stays at the same narrowband before hopping to another narrowband. For interval-FDD, int1 corresponds to 1 subframe, int2 corresponds to 2 subframes, and so on. For interval-TDD, int1 corresponds to 1 subframe, int5 corresponds to 5 subframes, and so on. |
| ***interval-ULHoppingConfigCommonModeX***  Number of consecutive absolute subframes over which PUCCH or PUSCH for CE mode X stays at the same narrowband before hopping to another narrowband. For interval-FDD, int1 corresponds to 1 subframe, int2 corresponds to 2 subframes, and so on. For interval-TDD, int1 corresponds to 1 subframe, int5 corresponds to 5 subframes, and so on. |
| ***modificationPeriodCoeff***  Actual modification period, expressed in number of radio frames= *modificationPeriodCoeff* \* *defaultPagingCycle*. n2 corresponds to value 2, n4 corresponds to value 4, n8 corresponds to value 8, n16 corresponds to value 16, and n64 corresponds to value 64. |
| ***mpdcch-NumRepetition-Paging***  Maximum number of repetitions for MPDCCH common search space (CSS) for paging, see TS 36.211 [21]. |
| ***mpdcch-pdsch-HoppingOffset***  Parameter: cid:image020.png@01D1F4C1.16D3F4B0, see TS 36.211 [21], clause 6.4.1. |
| ***mpdcch-pdsch-HoppingNB***  The number of narrowbands for MPDCCH/PDSCH frequency hopping. Value nb2 corresponds to 2 narrowbands and value nb4 corresponds to 4 narrowbands. |
| ***nB***  Parameter: nB is used as one of parameters to derive the Paging Frame and Paging Occasion according to TS 36.304 [4]. Value in multiples of 'T' as defined in TS 36.304 [4]. A value of fourT corresponds to 4 \* T, a value of twoT corresponds to 2 \* T and so on. In case *nB-v1310* is signalled, the UE shall ignore *nB* (i.e. without suffix). EUTRAN configures *nB-v1310* only in the BR version of SI message. |
| ***paging-narrowBands***  Number of narrowbands used for paging, see TS 36.304 [4], TS 36.212 [22] and TS 36.213 [23]. |
| ***p-Max***  Pmax to be used in the target cell. If absent, for the band used in the target cell, the UE applies the maximum power according to its capability as specified in 36.101 [42], clause 6.2.2. In case the UE is configured with uplink intra-band contiguous CA and the UE indicates *ue-CA-PowerClass-N* in that band combination, then the *p-Max* in *RadioResourceConfigCommonSCell* for that SCell, if present, also applies for that band combination whenever that SCell is activated. |
| ***prach-ConfigSCell***  Indicates a PRACH configuration for an SCell. The field is not applicable for an LAA SCell in this release. |
| ***rach-ConfigCommonSCell***  Indicates a RACH configuration for an SCell. The field is not applicable for an LAA SCell in this release. |
| ***rss-MeasConfig***  Indicates whether RSS-based measurement is enabled. | |
| ***rss-MeasNonNCL***  Indicates RSS of neighbour cells not in the Neighbour Cell List may be used for measurements. When this field is included, the UE assumes for all neighbour cells not in the Neighbour Cell List the RSS power bias is same as used for the serving cell or the camped cell. | |
| ***soundingRS-FlexibleTiming***  Indicates the SRS flexible timing (if configured) for aperiodic SRS triggered by DL grant. If the SRS transmission is collided with ACK/NACK, postpone once to the next configured SRS transmission opportunity. |
| ***ul-Bandwidth***  Parameter: transmission bandwidth configuration, NRB, in uplink, see TS 36.101 [42], table 5.6-1. 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. |
| ***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, applies.  For TDD: This parameter is absent and it is equal to the downlink frequency. |
| ***ul-CyclicPrefixLength***  Parameter: Uplink cyclic prefix length see TS 36.211 [21], clause 5.2.1, where len1 corresponds to normal cyclic prefix and len2 corresponds to extended cyclic prefix. |

| **Conditional presence** | **Explanation** |
| --- | --- |
| *EDT* | The field is optionally present, Need OR, if *edt-Parameters* is present; otherwise the field is not present and the UE shall delete any existing value for this field. |
| *MP-A* | The field is mandatory present for CE mode A. Otherwise the field is optional, Need OR. |
| *MP-B* | The field is mandatory present for CE mode B. Otherwise the field is optional, Need OR. |
| *TDD* | The field is optional for TDD, Need ON; it is not present for FDD and the UE shall delete any existing value for this field. |
| *TDD2* | If *tdd-Config-r10* is present, the field is optional, Need OR. Otherwise the field is not present and the UE shall delete any existing value for this field. |
| *TDD3* | If *tdd-Config* is present, the field is optional, Need OR. Otherwise the field is not present and the UE shall delete any existing value for this field. |
| *TDD-OR-NoR11* | If *prach-ConfigSCell-r11* is absent, the field is optional for TDD, Need OR. Otherwise the field is not present and the UE shall delete any existing value for this field. |
| *TDDSCell* | This field is mandatory present for TDD; it is not present for FDD and LAA SCell, and the UE shall delete any existing value for this field. |
| *UL* | If the SCell is part of the STAG or concerns the PSCell or PUCCH SCell and if *ul-Configuration* is included, the field is optional, Need OR. Otherwise the field is not present and the UE shall delete any existing value for this field. |
| *ULSCell* | For the PSCell (IE is included in *RadioResourceConfigCommonPSCell*) the field is absent. Otherwise, if the SCell is part of the STAG and if *ul-Configuration* is included, the field is optional, Need OR. Otherwise the field is not present and the UE shall delete any existing value for this field. |
| *ULSRS* | If *ul-Configuration-r10* is absent, the field is optional, Need OR. Otherwise the field is not present and the UE shall delete any existing value for this field. |

#### – *RadioResourceConfigDedicated*

The IE *RadioResourceConfigDedicated* is used to setup/modify/release RBs, to modify the MAC main configuration, to modify the SPS configuration and to modify dedicated physical configuration.

*RadioResourceConfigDedicated* information element

-- ASN1START

RadioResourceConfigDedicated ::= SEQUENCE {

srb-ToAddModList SRB-ToAddModList OPTIONAL, -- Cond HO-Conn

drb-ToAddModList DRB-ToAddModList OPTIONAL, -- Cond HO-toEUTRA

drb-ToReleaseList DRB-ToReleaseList OPTIONAL, -- Need ON

mac-MainConfig CHOICE {

explicitValue MAC-MainConfig,

defaultValue NULL

} OPTIONAL, -- Cond HO-toEUTRA2

sps-Config SPS-Config OPTIONAL, -- Need ON

physicalConfigDedicated PhysicalConfigDedicated OPTIONAL, -- Need ON

...,

[[ rlf-TimersAndConstants-r9 RLF-TimersAndConstants-r9 OPTIONAL -- Need ON

]],

[[ measSubframePatternPCell-r10 MeasSubframePatternPCell-r10 OPTIONAL -- Need ON

]],

[[ neighCellsCRS-Info-r11 NeighCellsCRS-Info-r11 OPTIONAL -- Need ON

]],

[[ naics-Info-r12 NAICS-AssistanceInfo-r12 OPTIONAL -- Need ON

]],

[[ neighCellsCRS-Info-r13 NeighCellsCRS-Info-r13 OPTIONAL, -- Cond CRSIM

rlf-TimersAndConstants-r13 RLF-TimersAndConstants-r13 OPTIONAL -- Need ON

]],

[[ sps-Config-v1430 SPS-Config-v1430 OPTIONAL -- Cond SPS

]],

[[ srb-ToAddModListExt-r15 SRB-ToAddModListExt-r15 OPTIONAL, -- Need ON

srb-ToReleaseListExt-r15 INTEGER (4) OPTIONAL, -- Need ON

sps-Config-v1530 SPS-Config-v1530 OPTIONAL, -- Need ON

crs-IntfMitigConfig-r15 CHOICE {

release NULL,

setup CHOICE { crs-IntfMitigEnabled-15 NULL,

crs-IntfMitigNumPRBs-r15 ENUMERATED {n6, n24}

}

} OPTIONAL, -- Need ON

neighCellsCRS-Info-r15 NeighCellsCRS-Info-r15 OPTIONAL, -- Need ON

drb-ToAddModList-r15 DRB-ToAddModList-r15 OPTIONAL, -- Need ON

drb-ToReleaseList-r15 DRB-ToReleaseList-r15 OPTIONAL, -- Need ON

dummy SEQUENCE (SIZE (1..2)) OF INTEGER (1..2) OPTIONAL -- Need ON

]],

[[ sps-Config-v1540 SPS-Config-v1540 OPTIONAL -- Need ON

]],

[[

rlf-TimersAndConstantsMCG-Failure-r16 RLF-TimersAndConstantsMCG-Failure-r16

OPTIONAL, -- Cond Split-SRB1-SRB3

crs-ChEstMPDCCH-ConfigDedicated-r16 SetupRelease{CRS-ChEstMPDCCH-ConfigDedicated-r16} OPTIONAL -- Need ON

]]

}

RadioResourceConfigDedicated-v1370 ::= SEQUENCE {

physicalConfigDedicated-v1370 PhysicalConfigDedicated-v1370 OPTIONAL -- Need ON

}

RadioResourceConfigDedicated-v13c0 ::= SEQUENCE {

physicalConfigDedicated-v13c0 PhysicalConfigDedicated-v13c0

}

RadioResourceConfigDedicatedPSCell-r12 ::= SEQUENCE {

-- UE specific configuration extensions applicable for an PSCell

physicalConfigDedicatedPSCell-r12 PhysicalConfigDedicated OPTIONAL, -- Need ON

sps-Config-r12 SPS-Config OPTIONAL, -- Need ON

naics-Info-r12 NAICS-AssistanceInfo-r12 OPTIONAL, -- Need ON

...,

[[ neighCellsCRS-InfoPSCell-r13 NeighCellsCRS-Info-r13 OPTIONAL -- Need ON

]],

[[ sps-Config-v1430 SPS-Config-v1430 OPTIONAL -- Cond SPS2

]],

[[ sps-Config-v1530 SPS-Config-v1530 OPTIONAL, -- Need ON

crs-IntfMitigEnabled-r15 BOOLEAN OPTIONAL, -- Need ON

neighCellsCRS-Info-r15 NeighCellsCRS-Info-r15 OPTIONAL -- Need ON

]],

[[ sps-Config-v1540 SPS-Config-v1540 OPTIONAL -- Need ON

]]

}

RadioResourceConfigDedicatedPSCell-v1370 ::= SEQUENCE {

physicalConfigDedicatedPSCell-v1370 PhysicalConfigDedicated-v1370 OPTIONAL -- Need ON

}

RadioResourceConfigDedicatedPSCell-v13c0 ::= SEQUENCE {

physicalConfigDedicatedPSCell-v13c0 PhysicalConfigDedicated-v13c0

}

RadioResourceConfigDedicatedSCG-r12 ::= SEQUENCE {

drb-ToAddModListSCG-r12 DRB-ToAddModListSCG-r12 OPTIONAL, -- Need ON

mac-MainConfigSCG-r12 MAC-MainConfig OPTIONAL, -- Need ON

rlf-TimersAndConstantsSCG-r12 RLF-TimersAndConstantsSCG-r12 OPTIONAL, -- Need ON

...,

[[ drb-ToAddModListSCG-r15 DRB-ToAddModListSCG-r15 OPTIONAL -- Need ON

]],

[[ srb-ToAddModListSCG-r15 SRB-ToAddModList OPTIONAL, -- Need ON

srb-ToReleaseListSCG-r15 SRB-ToReleaseList-r15 OPTIONAL -- Need ON

]],

[[ -- NE-DC additions for release of RLC bearer config for DRBs

drb-ToReleaseListSCG-r15 DRB-ToReleaseList-r15 OPTIONAL -- Need ON

]]

}

RadioResourceConfigDedicatedSCell-r10 ::= SEQUENCE {

-- UE specific configuration extensions applicable for an SCell

physicalConfigDedicatedSCell-r10 PhysicalConfigDedicatedSCell-r10 OPTIONAL, -- Need ON

...,

[[ mac-MainConfigSCell-r11 MAC-MainConfigSCell-r11 OPTIONAL -- Cond SCellAdd

]],

[[ naics-Info-r12 NAICS-AssistanceInfo-r12 OPTIONAL -- Need ON

]],

[[ neighCellsCRS-InfoSCell-r13 NeighCellsCRS-Info-r13 OPTIONAL -- Need ON

]],

[[ physicalConfigDedicatedSCell-v1370 PhysicalConfigDedicatedSCell-v1370 OPTIONAL -- Need ON

]],

[[ crs-IntfMitigEnabled-r15 BOOLEAN OPTIONAL, -- Need ON

neighCellsCRS-Info-r15 NeighCellsCRS-Info-r15 OPTIONAL, -- Need ON

sps-Config-v1530 SPS-Config-v1530 OPTIONAL -- Need ON

]]

}

RadioResourceConfigDedicatedSCell-v13c0 ::= SEQUENCE {

physicalConfigDedicatedSCell-v13c0 PhysicalConfigDedicatedSCell-v13c0

}

SRB-ToAddModList ::= SEQUENCE (SIZE (1..2)) OF SRB-ToAddMod

SRB-ToAddModListExt-r15 ::= SEQUENCE (SIZE (1)) OF SRB-ToAddMod

SRB-ToAddMod ::= SEQUENCE {

srb-Identity INTEGER (1..2),

rlc-Config CHOICE {

explicitValue RLC-Config,

defaultValue NULL

} OPTIONAL, -- Cond Setup

logicalChannelConfig CHOICE {

explicitValue LogicalChannelConfig,

defaultValue NULL

} OPTIONAL, -- Cond Setup

...,

[[ pdcp-verChange-r15 ENUMERATED {true} OPTIONAL, -- Cond NR-PDCP

rlc-Config-v1530 RLC-Config-v1530 OPTIONAL, -- Need ON

rlc-BearerConfigSecondary-r15 RLC-BearerConfig-r15 OPTIONAL, -- Need ON

srb-Identity-v1530 INTEGER (4) OPTIONAL -- Need ON

]],

[[ rlc-Config-v1560 RLC-Config-v1510 OPTIONAL -- Need ON

]]

}

DRB-ToAddModList ::= SEQUENCE (SIZE (1..maxDRB)) OF DRB-ToAddMod

DRB-ToAddModList-r15 ::= SEQUENCE (SIZE (1..maxDRB-r15)) OF DRB-ToAddMod

DRB-ToAddModListSCG-r12 ::= SEQUENCE (SIZE (1..maxDRB)) OF DRB-ToAddModSCG-r12

DRB-ToAddModListSCG-r15 ::= SEQUENCE (SIZE (1..maxDRB-r15)) OF DRB-ToAddModSCG-r12

DRB-ToAddMod ::= SEQUENCE {

eps-BearerIdentity INTEGER (0..15) OPTIONAL, -- Cond DRB-Setup

drb-Identity DRB-Identity,

pdcp-Config PDCP-Config OPTIONAL, -- Cond PDCP

rlc-Config RLC-Config OPTIONAL, -- Cond SetupM

logicalChannelIdentity INTEGER (3..10) OPTIONAL, -- Cond DRB-SetupM

logicalChannelConfig LogicalChannelConfig OPTIONAL, -- Cond SetupM

...,

[[ drb-TypeChange-r12 ENUMERATED {toMCG} OPTIONAL, -- Need OP

rlc-Config-v1250 RLC-Config-v1250 OPTIONAL -- Need ON

]],

[[ rlc-Config-v1310 RLC-Config-v1310 OPTIONAL, -- Need ON

drb-TypeLWA-r13 BOOLEAN OPTIONAL, -- Need ON

drb-TypeLWIP-r13 ENUMERATED {lwip, lwip-DL-only,

lwip-UL-only, eutran} OPTIONAL -- Need ON

]],

[[ rlc-Config-v1430 RLC-Config-v1430 OPTIONAL, -- Need ON

lwip-UL-Aggregation-r14 BOOLEAN OPTIONAL, -- Cond LWIP

lwip-DL-Aggregation-r14 BOOLEAN OPTIONAL, -- Cond LWIP

lwa-WLAN-AC-r14 ENUMERATED {ac-bk, ac-be, ac-vi, ac-vo} OPTIONAL -- Cond UL-LWA

]],

[[ rlc-Config-v1510 RLC-Config-v1510 OPTIONAL -- Need ON

]],

[[ rlc-Config-v1530 RLC-Config-v1530 OPTIONAL, -- Need ON

rlc-BearerConfigSecondary-r15 RLC-BearerConfig-r15 OPTIONAL, -- Need ON

logicalChannelIdentity-r15 INTEGER (32..38) OPTIONAL -- Need ON

]],

[[ daps-HO-r16 ENUMERATED {true} OPTIONAL -- Cond NotFullConfigHO

]]

}

DRB-ToAddModSCG-r12 ::= SEQUENCE {

drb-Identity-r12 DRB-Identity,

drb-Type-r12 CHOICE {

split-r12 NULL,

scg-r12 SEQUENCE {

eps-BearerIdentity-r12 INTEGER (0..15) OPTIONAL, -- Cond DRB-Setup

pdcp-Config-r12 PDCP-Config OPTIONAL -- Cond PDCP-S

}

} OPTIONAL, -- Cond SetupS2

rlc-ConfigSCG-r12 RLC-Config OPTIONAL, -- Cond SetupS

rlc-Config-v1250 RLC-Config-v1250 OPTIONAL, -- Need ON

logicalChannelIdentitySCG-r12 INTEGER (3..10) OPTIONAL, -- Cond DRB-SetupS

logicalChannelConfigSCG-r12 LogicalChannelConfig OPTIONAL, -- Cond SetupS

...,

[[ rlc-Config-v1430 RLC-Config-v1430 OPTIONAL -- Need ON

]],

[[ logicalChannelIdentitySCG-r15 INTEGER (32..38) OPTIONAL, -- Need ON

rlc-Config-v1530 RLC-Config-v1530 OPTIONAL, -- Need ON

rlc-BearerConfigSecondary-r15 RLC-BearerConfig-r15 OPTIONAL -- Need ON

]],

[[ rlc-Config-v1560 RLC-Config-v1510 OPTIONAL -- Need ON

]]

}

DRB-ToReleaseList ::= SEQUENCE (SIZE (1..maxDRB)) OF DRB-Identity

DRB-ToReleaseList-r15 ::= SEQUENCE (SIZE (1..maxDRB-r15)) OF DRB-Identity

SRB-ToReleaseList-r15 ::= SEQUENCE (SIZE (1..2)) OF INTEGER (1..2)

MeasSubframePatternPCell-r10 ::= CHOICE {

release NULL,

setup MeasSubframePattern-r10

}

NeighCellsCRS-Info-r11 ::= CHOICE {

release NULL,

setup CRS-AssistanceInfoList-r11

}

CRS-AssistanceInfoList-r11 ::= SEQUENCE (SIZE (1..maxCellReport)) OF CRS-AssistanceInfo-r11

CRS-AssistanceInfo-r11 ::= SEQUENCE {

physCellId-r11 PhysCellId,

antennaPortsCount-r11 ENUMERATED {an1, an2, an4, spare1},

mbsfn-SubframeConfigList-r11 MBSFN-SubframeConfigList,

...,

[[ mbsfn-SubframeConfigList-v1430 MBSFN-SubframeConfigList-v1430 OPTIONAL -- Need ON

]]

}

NeighCellsCRS-Info-r13 ::= CHOICE {

release NULL,

setup CRS-AssistanceInfoList-r13

}

CRS-AssistanceInfoList-r13 ::= SEQUENCE (SIZE (1..maxCellReport)) OF CRS-AssistanceInfo-r13

CRS-AssistanceInfo-r13 ::= SEQUENCE {

physCellId-r13 PhysCellId,

antennaPortsCount-r13 ENUMERATED {an1, an2, an4, spare1},

mbsfn-SubframeConfigList-r13 MBSFN-SubframeConfigList OPTIONAL, -- Need ON

...,

[[ mbsfn-SubframeConfigList-v1430 MBSFN-SubframeConfigList-v1430 OPTIONAL -- Need ON

]]

}

NeighCellsCRS-Info-r15 ::= CHOICE {

release NULL,

setup CRS-AssistanceInfoList-r15

}

CRS-AssistanceInfoList-r15 ::= SEQUENCE (SIZE (1..maxCellReport)) OF CRS-AssistanceInfo-r15

CRS-AssistanceInfo-r15 ::= SEQUENCE {

physCellId-r15 PhysCellId,

crs-IntfMitigEnabled-15 ENUMERATED {enabled} OPTIONAL -- Need ON

}

NAICS-AssistanceInfo-r12 ::= CHOICE {

release NULL,

setup SEQUENCE {

neighCellsToReleaseList-r12 NeighCellsToReleaseList-r12 OPTIONAL , -- Need ON

neighCellsToAddModList-r12 NeighCellsToAddModList-r12 OPTIONAL, -- Need ON

servCellp-a-r12 P-a OPTIONAL -- Need ON

}

}

NeighCellsToReleaseList-r12 ::= SEQUENCE (SIZE (1..maxNeighCell-r12)) OF PhysCellId

NeighCellsToAddModList-r12 ::= SEQUENCE (SIZE (1..maxNeighCell-r12)) OF NeighCellsInfo-r12

NeighCellsInfo-r12 ::= SEQUENCE {

physCellId-r12 PhysCellId,

p-b-r12 INTEGER (0..3),

crs-PortsCount-r12 ENUMERATED {n1, n2, n4, spare},

mbsfn-SubframeConfig-r12 MBSFN-SubframeConfigList OPTIONAL, -- Need ON

p-aList-r12 SEQUENCE (SIZE (1..maxP-a-PerNeighCell-r12)) OF P-a,

transmissionModeList-r12 BIT STRING (SIZE(8)),

resAllocGranularity-r12 INTEGER (1..4),

...

}

P-a ::= ENUMERATED { dB-6, dB-4dot77, dB-3, dB-1dot77,

dB0, dB1, dB2, dB3}

RLC-BearerConfig-r15 ::= CHOICE {

release NULL,

setup SEQUENCE {

rlc-Config-r15 RLC-Config-r15 OPTIONAL, -- Need ON

logicalChannelIdentityConfig-r15 CHOICE {

logicalChannelIdentity-r15 INTEGER (1..10),

logicalChannelIdentityExt-r15 INTEGER (32..38)

},

logicalChannelConfig-r15 LogicalChannelConfig OPTIONAL -- Need ON

}

}

-- ASN1STOP

| *RadioResourceConfigDedicated* field descriptions |
| --- |
| ***crs-ChEstMPDCCH-ConfigDedicated***  Indicates whether use of CRS for improving channel estimation on MPDCCH is enabled in RRC\_CONNECTED mode for UEs indicating support of *ce-CRS-ChannelEstMPDCCH*. If this field is not configured, the field *crs-ChEstMPDCCH-ConfigCommon* in *SystemInformationBlockType2* applies, if present. |
| ***crs-IntfMitigConfig***  *crs-IntfMitigEnabled-r15* indicates CRS interference mitigation is enabled for the cell, as specified in TS 36.133 [16], clause 3.6.1.1. For BL UEs or UEs in CE supporting *ce-CRS-IntfMitig,* presence of this field indicates CRS interference mitigation is enabled in the cell, as specified in TS 36.133 [16], clauses 3.6.1.2 and 3.6.1.3, and the value *crs-IntfMitigNumPRBs* indicatesnumber of PRBs, i.e. 6 or 24 PRBs, for CRS transmission in the central cell BW when CRS interference mitigation is enabled. For UEs not supporting this feature, the behaviour is undefined if this field is configured and the field *cellBarred* in *SystemInformationBlockType1* (*SystemInformationBlockType1-BR* for BL UEs or UEs in CE) is set to *notbarred*. |
| ***crs-PortsCount***  Parameter represents the number of antenna ports for cell-specific reference signal used by the signaled neighboring cell where n1 corresponds to 1 antenna port, n2 to 2 antenna ports etc. see TS 36.211 [21], clause 6.10.1. |
| ***daps-HO***  This field indicates that the handover, triggered in the same *RRCConnectionReconfiguration* message, shall be performed as a DAPS HO for the DRB. DAPS HO is not configured when the *fullConfig* is included. |
| ***drb-Identity***  In case of DC, the DRB identity is unique within the scope of the UE i.e. an SCG DRB can not use the same value as used for an MCG or split DRB. For a split DRB the same identity is used for the MCG- and SCG parts of the configuration. |
| ***drb-ToAddModList***  When *drb-ToAddModList-r15* is configured, UE shall ignore the *drb-ToAddModList* (without suffix). |
| ***drb-ToAddModListSCG***  When an SCG is configured, E-UTRAN configures at least one SCG or split DRB. *When drb-ToAddModListSCG-r15* is configured, UE shall ignore the *drb-ToAddModListSCG* (without suffix). When NE-DC is configured, this field indicates the SCG RLC bearers to be (re-)configured. |
| ***drb-ToReleaseList***  When *drb-ToReleaseList-r15* is configured, UE shall ignore the *drb-ToReleaseList* (without suffix). |
| ***drb-ToReleaseListSCG***  When NE-DC is configured, this field indicates the SCG RLC bearers to be released. |
| ***drb-Type***  This field indicates whether the DRB is split or SCG DRB. E-UTRAN does not configure split and SCG DRBs simultaneously for the UE. |
| ***drb-TypeChange***  Indicates that a split/SCG DRB is reconfigured to an MCG DRB (i.e. E-UTRAN only signals the field in case the DRB type changes). |
| ***drb-TypeLWA***  Indicates whether a DRB is (re)configured as an LWA DRB or an LWA DRB is reconfigured not to use WLAN resources. NOTE 1 |
| ***drb-TypeLWIP***  Indicates whether a DRB is (re)configured to use LWIP Tunnel in UL and DL (value *lwip*), DL only (value *lwip-DL-only*), UL only (value *lwip-UL-only*) or not to use LWIP Tunnel (value *eutran*). |
| ***dummy***  This field is not used in the specification. If received it shall be ignored by the UE. |
| ***logicalChannelConfig***  For SRBs a choice is used to indicate whether the logical channel configuration is signalled explicitly or set to the default logical channel configuration for SRB1 as specified in 9.2.1.1 or for SRB2 as specified in 9.2.1.2. |
| ***logicalChannelIdentity, LogicalChannelIdentityExt***  The logical channel identity for both UL and DL. Value 4 is not configured for DRBs if SRB4 is configured. When *logicalChannelIdentity-r15* is signalled, UE shall ignore contents of *logicalChannelIdentity* (without suffix). |
| ***logicalChannelIdentitySCG***  The logical channel identity for both UL and DL. When *logicalChannelIdentitySCG-r15* is signalled, UE shall ignore contents of *logicalChannelIdentitySCG* (without suffix). |
| ***lwa-WLAN-AC***  For LWA bearers, indicates the corresponding WLAN access category for uplink. AC-BK (value *ac-bk*) corresponds to Background access category, AC-BE (value *ac-be*) corresponds to Best Effort access category, AC-VI (value *ac-vi*) corresponds to Video access category and AC-VO (value *ac-vo*) corresponds to Voice access category as defined by IEEE 802.11-2012 [67]. If *lwa-WLAN-AC* is not configured, it is left up to UE to decide which IEEE 802.11 AC value to use when performing transmissions of packets for this DRB over WLAN in the uplink. |
| ***lwip-DL-Aggregation, lwip-UL-Aggregation***  Indicates whether LWIP is configured to utilize LWIP aggregation in DL or UL. |
| ***mac-MainConfig***  Although the ASN.1 includes a choice that is used to indicate whether the mac-MainConfig is signalled explicitly or set to the default MAC main configuration as specified in 9.2.2, EUTRAN does not apply "*defaultValue*". |
| ***mbsfn-SubframeConfig***  Defines the MBSFN subframe configuration used by the signaled neighboring cell. If absent, UE assumes no MBSFN configuration for the neighboring cell. |
| ***measSubframePatternPCell***  Time domain measurement resource restriction pattern for the PCell measurements (RSRP, RSRQ and the radio link monitoring). |
| ***neighCellsCRS-Info, neighCellsCRS-InfoSCell, neighCellsCRS-InfoPSCell***  This field contains assistance information used by the UE to mitigate interference from CRS while performing RRM/RLM/CSI measurement or data demodulation or DL control channel demodulation. When the received CRS assistance information is for a cell with CRS non-colliding with that of the CRS of the cell to measure, the UE may use the CRS assistance information to mitigate CRS interference. When the received CRS assistance information is for a cell with CRS colliding with that of the CRS of the cell to measure, the UE may use the CRS assistance information to mitigate CRS interference RRM/RLM (as specified in TS 36.133 [16]) and for CSI (as specified in TS 36.101 [42]) on the subframes indicated by *measSubframePatternPCell*, *measSubframePatternConfigNeigh*, *csi-MeasSubframeSet1* ifconfigured, and the CSI subframe set 1 if *csi-MeasSubframeSets-r12* is configured. The UE may use CRS assistance information to mitigate CRS interference from the cells in the *CRS-AssistanceInfoList* for the demodulation purpose or DL control channel demodulation as specified in TS 36.101 [42]. EUTRAN does not configure *neighCellsCRS-Info-r11* or *neighCellsCRS-Info-r13* if *eimta-MainConfigPCell-r12* is configured. |
| ***neighCellsToAddModList***  This field contains assistance information used by the UE to cancel and suppress interference of a neighbouring cell. If this field is present for a neighbouring cell, the UE assumes that the transmission parameters listed in the sub-fields are used by the neighbouring cell. If this field is present for a neighbouring cell, the UE assumes the neighbour cell is subframe and SFN synchronized to the serving cell, has the same system bandwidth, UL/DL and special subframe configuration, and cyclic prefix length as the serving cell. |
| ***p-aList***  Indicates the restricted subset of power offset for QPSK, 16QAM, and 64QAM PDSCH transmissions for the neighbouring cell by using the parameter, see TS 36.213 [23], clause 5.2. Value dB-6 corresponds to -6 dB, dB-4dot77 corresponds to -4.77 dB etc. |
| ***p-b***  Parameter: , indicates the cell-specific ratio used by the signaled neighboring cell, see TS 36.213 [23], Table 5.2-1. |
| ***pdcp-verChange***  Indicates that the PDCP version of the SRB is changed from NR PDCP to E-UTRA PDCP. Network only configures this version change for during handover, resume and first reconfiguration after re-establishment. E-UTRAN does not include this field when *SRB-ToAddMod* is included in *srb-ToAddModListSCG*. |
| ***physicalConfigDedicated***  The default dedicated physical configuration is specified in 9.2.4. |
| ***resAllocGranularity***  Indicates the resource allocation and precoding granularity in PRB pair level of the signaled neighboring cell, see TS 36.213 [23], clause 7.1.6. |
| ***rlc-BearerConfigSecondary***  The configuration of a secondary RLC bearer within the same Cell Group as may e.g. be used in case of PDCP duplication using CA. The configuration comprises a (secondary) RLC entity, a logical channel identity and a logical channel configuration. E-UTRAN may configure this for SRB1, SRB2 and DRBs. For SRBs, E-UTRAN only configures the field for MCG (i.e. if included in *radioResourceConfigDedicated*. E-UTRAN configures the same RLC mode (AM/ UM) as used for the original RLC entity. The primary RLC entity is configured by *RLC-Config*. |
| ***rlc-Config***  For SRBs a choice is used to indicate whether the RLC configuration is signalled explicitly or set to the values defined in the default RLC configuration for SRB1 in 9.2.1.1 or for SRB2 in 9.2.1.2. RLC AM is the only applicable RLC mode for SRB1 and SRB2. E-UTRAN does not reconfigure the RLC mode of DRBs except when a full configuration option is used, and may reconfigure the RLC SN field size and the AM RLC LI field size only upon handover within E-UTRA or upon the first reconfiguration after RRC connection re-establishment or upon SCG Change for SCG and split DRBs. |
| ***servCellp-a***  Indicates the power offset for QPSK C-RNTI based PDSCH transmissions used by the serving cell, see TS 36.213 [23], clause 5.2. Value dB-6 corresponds to -6 dB, dB-4dot77 corresponds to -4.77 dB etc. |
| ***sps-Config***  The default SPS configuration is specified in 9.2.3. Except for handover or releasing SPS for MCG, E-UTRAN does not reconfigure *sps-Config* for MCG when there is a configured downlink assignment or a configured uplink grant for MCG (see TS 36.321 [6]). Except for SCG change or releasing SPS for SCG, E-UTRAN does not reconfigure *sps-Config* for SCG when there is a configured downlink assignment or a configured uplink grant for SCG (see TS 36.321 [6]). In one serving cell, *sps-Config-v1530* is not present simultaneously with either *sps-Config* (without suffix) or *sps-Config-r12*. |
| ***srb-Identity***  Value 1 is applicable for SRB1 only. Value 2 is applicable for SRB2 only. Value 4 is applicable for SRB4 only, if configured. For a split SRB the same identity is used for the MCG and NR SCG RLC bearer configurations. If *srb-Identity-v1530* is received, the UE shall ignore *srb-Identity* (i.e. without suffix). |
| ***srb-Identity-v1530***  E-UTRAN does not include this field when *SRB-ToAddMod* is included in *srb-ToAddModListSCG*. |
| ***srb-ToAddModListExt***  The field is to configure SRB4. |
| ***srb-ToAddModList***  E-UTRAN configures the same RAT type (i.e. EUTRA or NR) for PDCP configuration of SRB1 and SRB2. |
| ***transmissionModeList***  Indicates a subset of transmission mode 1, 2, 3, 4, 6, 8, 9, 10, for the signaled neighboring cell for which *NeighCellsInfo* applies. When TM10 is signaled, other signaled transmission parameters in *NeighCellsInfo* are not applicable to up to 8 layer transmission scheme of TM10. E-UTRAN may indicate TM9 when TM10 with QCL type A and DMRS scrambling with  in TS 36.211 [21], clause 6.10.3.1, is used in the signalled neighbour cell and TM9 or TM10 with QCL type A and DMRS scrambling with  in TS 36.211 [21], clause 6.10.3.1, is used in the serving cell. UE behaviour with NAICS when TM10 is used is only defined when QCL type A and DMRS scrambling with  in TS 36.211 [21], clause 6.10.3.1, is used for the serving cell and all signalled neighbour cells. The first/ leftmost bit is for transmission mode 1, the second bit is for transmission mode 2, and so on. |

NOTE 1: It is up to eNB to ensure that the field indicating LWA bearer type is set to FALSE when LWA bearer is no longer used (e.g. during handover or re-establishment where LWA configuration is released).

| Conditional presence | Explanation |
| --- | --- |
| CRSIM | The field is optionally present, need ON, if *neighCellsCRS-Info-r11* is not present; otherwise it is not present. |
| *DRB-Setup* | The field is mandatory present if the corresponding DRB is being set up and the UE is connected to EPC; otherwise it is not present. |
| *DRB-SetupM* | The field is:  - mandatory present:  - for the UE without SCG: upon setup of MCG DRB;  - for E-UTRA DC, upon setup of MCG or split DRB;  - for (NG)EN-DC:  - upon setup of MCG RLC bearer;  - optionally present, Need ON:  - for E-UTRA DC, upon change from SCG to MCG DRB;  - for (NG)EN-DC:  - upon change of *keyToUse*, as defined in TS 38.331 [82], for a DRB configured with an MCG RLC bearer;  - when configured with MCG RLC bearer, upon change of S-KgNB without handover;  - not present otherwise. |
| *DRB-SetupS* | The field is:  - mandatory present:  - for E-UTRA DC:  - upon setup of SCG or split DRB;  - upon change from MCG to split DRB;  - for NE-DC:  - upon setup of SCG RLC bearer;  - optionally present, Need ON:  - for E-UTRA DC, upon change from MCG to SCG DRB;  - for NE-DC, upon change of *keyToUse*, as defined in TS 38.331 [82], for a DRB configured with an SCG RLC bearer;  - not present otherwise. |
| *HO-Conn* | The field is mandatory present in case of handover to E-UTRA or when the *fullConfig* is included in the *RRCConnectionReconfiguration* message or in case of RRC connection establishment (excluding *RRConnectionResume*); otherwise the field is optionally present, need ON. Upon connection establishment/ re-establishment only SRB1 is applicable (excluding *RRConnectionResume*). |
| *HO-toEUTRA* | The field is mandatory present  - in case of handover to E-UTRA or  - when the *fullConfig* is included in the *RRCConnectionReconfiguration* message with the configuration for at least one MCG bearer or split data bearer;  In case of RRC connection establishment (excluding *RRConnectionResume*); and RRC connection re-establishment the field is not present; otherwise the field is optionally present, need ON. |
| *HO-toEUTRA2* | The field is mandatory present in case of handover to E-UTRA or when the *fullConfig* is included in the *RRCConnectionReconfiguration* message; otherwise the field is optionally present, need ON. |
| *LWIP* | The field is optionally present, Need ON, if *drb-TypeLWIP-r13* is configured and not set to eutran; otherwise it is not present and the UE shall delete any existing value for this field. |
| *NotFullConfigHO* | This field is optionally present, Need ON, in case of handover within E-UTRA when the *fullConfig* is not included in the *RRCConnectionReconfiguration* message. Otherwise the field is not present. |
| *NR-PDCP* | The field is optional present, Need ON, when the SRB is configured with NR-PDCP prior to reception of this reconfiguration message. Otherwise it is not present. |
| *PDCP* | The field is mandatory present:  - when connected to E-UTRA/EPC:  - for the bearers configured with E-UTRA PDCP, if the corresponding DRB is being setup;  the field is optionally present, need ON: :  - when connected to E-UTRA/EPC:  - for the bearers configured with E-UTRA PDCP, upon reconfiguration of the corresponding split DRB or LWA DRB, upon the corresponding DRB type change from split to MCG bearer, upon the corresponding DRB type change from MCG to split bearer or LWA bearer, upon the corresponding DRB type change from LWA to LTE only bearer, upon handover within E-UTRA and upon the first reconfiguration after re-establishment but in all these cases only when *fullConfig* is not included in the *RRCConnectionReconfiguration* message;  otherwise it is not present. |
| *PDCP-S* | The field is mandatory present if the corresponding DRB is being setup; the field is optionally present, need ON, upon SCG change; otherwise it is not present. |
| *RLC-Setup* | This field is optionally present if the corresponding DRB is being setup, need ON; otherwise it is not present. |
| *SCellAdd* | The field is optionally present, need ON, upon SCell addition; otherwise it is not present. |
| *Setup* | The field is mandatory present if the corresponding SRB/DRB is being setup; otherwise the field is optionally present, need ON. |
| *SetupM* | The field is mandatory present upon setup of an MCG or split DRB, or upon setup of MCG RLC bearer; otherwise the field is optionally present, need ON. |
| *SetupS* | The field is mandatory present:  - for E-UTRA DC:  - upon setup of an SCG or split DRB,  - upon change from MCG to split DRB;  - for NE-DC, upon setup of SCG RLC bearer;  otherwise the field is optionally present, need ON. |
| *SetupS2* | The field is:  - mandatory present:  - for E-UTRA DC:  - upon setup of an SCG or split DRB, as well as upon change from MCG to split or SCG DRB.  - optionally present, need ON:  - for E-UTRA DC:  - for an SCG DRB  otherwise the field is not present. |
| *Split-SRB1-SRB3* | This field is optionally present, Need ON, if the UE is configured with split SRB1 or SRB3. It is absent otherwise. |
| *SPS* | The field is optionally present, need ON, if sps-Config (without suffix) is not configured; otherwise it is not present. |
| *SPS2* | The field is optionally present, need ON, if sps-Config-r12 is not configured; otherwise it is not present. |
| *UL-LWA* | The field is optionally present, need ON if *ul-LWA-Config-r14* is present. Otherwise the field is not present. |

#### – *UplinkPowerControl*

The IE *UplinkPowerControlCommon* and IE *UplinkPowerControlDedicated* are used to specify parameters for uplink power control in the system information and in the dedicated signalling, respectively.

*UplinkPowerControl* information elements

-- ASN1START

UplinkPowerControlCommon ::= SEQUENCE {

p0-NominalPUSCH INTEGER (-126..24),

alpha Alpha-r12,

p0-NominalPUCCH INTEGER (-127..-96),

deltaFList-PUCCH DeltaFList-PUCCH,

deltaPreambleMsg3 INTEGER (-1..6)

}

UplinkPowerControlCommon-v1020 ::= SEQUENCE {

deltaF-PUCCH-Format3-r10 ENUMERATED {deltaF-1, deltaF0, deltaF1, deltaF2,

deltaF3, deltaF4, deltaF5, deltaF6},

deltaF-PUCCH-Format1bCS-r10 ENUMERATED {deltaF1, deltaF2, spare2, spare1}

}

UplinkPowerControlCommon-v1310 ::= SEQUENCE {

deltaF-PUCCH-Format4-r13 ENUMERATED {deltaF16, deltaF15, deltaF14,deltaF13, deltaF12,

deltaF11, deltaF10, spare1} OPTIONAL, -- Need OR

deltaF-PUCCH-Format5-13 ENUMERATED { deltaF13, deltaF12, deltaF11, deltaF10, deltaF9,

deltaF8, deltaF7, spare1} OPTIONAL -- Need OR

}

UplinkPowerControlCommon-v1530 ::= SEQUENCE {

deltaFList-SPUCCH-r15 DeltaFList-SPUCCH-r15

}

UplinkPowerControlCommon-v16xy ::= SEQUENCE {

alphaSRS-Add-r16 Alpha-r12,

p0-NominalSRS-Add-r16 INTEGER (-126..24)

}

UplinkPowerControlCommonPSCell-r12 ::= SEQUENCE {

-- For uplink power control the additional/ missing fields are signalled (compared to SCell)

deltaF-PUCCH-Format3-r12 ENUMERATED {deltaF-1, deltaF0, deltaF1, deltaF2,

deltaF3, deltaF4, deltaF5, deltaF6},

deltaF-PUCCH-Format1bCS-r12 ENUMERATED {deltaF1, deltaF2, spare2, spare1},

p0-NominalPUCCH-r12 INTEGER (-127..-96),

deltaFList-PUCCH-r12 DeltaFList-PUCCH

}

UplinkPowerControlCommonSCell-r10 ::= SEQUENCE {

p0-NominalPUSCH-r10 INTEGER (-126..24),

alpha-r10 Alpha-r12

}

UplinkPowerControlCommonSCell-v1130 ::= SEQUENCE {

deltaPreambleMsg3-r11 INTEGER (-1..6)

}

UplinkPowerControlCommonSCell-v1310 ::= SEQUENCE {

-- For uplink power control the additional/ missing fields are signalled (compared to SCell)

p0-NominalPUCCH INTEGER (-127..-96),

deltaFList-PUCCH DeltaFList-PUCCH,

deltaF-PUCCH-Format3-r12 ENUMERATED {deltaF-1, deltaF0, deltaF1,

deltaF2, deltaF3, deltaF4, deltaF5,

deltaF6} OPTIONAL, -- Need OR

deltaF-PUCCH-Format1bCS-r12 ENUMERATED {deltaF1, deltaF2,

spare2, spare1} OPTIONAL, -- Need OR

deltaF-PUCCH-Format4-r13 ENUMERATED {deltaF16, deltaF15, deltaF14,

deltaF13, deltaF12, deltaF11, deltaF10,

spare1} OPTIONAL, -- Need OR

deltaF-PUCCH-Format5-13 ENUMERATED { deltaF13, deltaF12, deltaF11,

deltaF10, deltaF9, deltaF8, deltaF7,

spare1} OPTIONAL -- Need OR

}

UplinkPowerControlCommonPUSCH-LessCell-v1430 ::= SEQUENCE {

p0-Nominal-PeriodicSRS-r14 INTEGER (-126..24) OPTIONAL, -- Need OR

p0-Nominal-AperiodicSRS-r14 INTEGER (-126..24) OPTIONAL, -- Need OR

alpha-SRS-r14 Alpha-r12 OPTIONAL -- Need OR

}

UplinkPowerControlDedicated ::= SEQUENCE {

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

deltaMCS-Enabled ENUMERATED {en0, en1},

accumulationEnabled BOOLEAN,

p0-UE-PUCCH INTEGER (-8..7),

pSRS-Offset INTEGER (0..15),

filterCoefficient FilterCoefficient DEFAULT fc4

}

UplinkPowerControlDedicated-v1020 ::= SEQUENCE {

deltaTxD-OffsetListPUCCH-r10 DeltaTxD-OffsetListPUCCH-r10 OPTIONAL, -- Need OR

pSRS-OffsetAp-r10 INTEGER (0..15) OPTIONAL -- Need OR

}

UplinkPowerControlDedicated-v1130 ::= SEQUENCE {

pSRS-Offset-v1130 INTEGER (16..31) OPTIONAL, -- Need OR

pSRS-OffsetAp-v1130 INTEGER (16..31) OPTIONAL, -- Need OR

deltaTxD-OffsetListPUCCH-v1130 DeltaTxD-OffsetListPUCCH-v1130 OPTIONAL -- Need OR

}

UplinkPowerControlDedicated-v1250 ::= SEQUENCE {

set2PowerControlParameter CHOICE {

release NULL,

setup SEQUENCE {

tpc-SubframeSet-r12 BIT STRING (SIZE(10)),

p0-NominalPUSCH-SubframeSet2-r12 INTEGER (-126..24),

alpha-SubframeSet2-r12 Alpha-r12,

p0-UE-PUSCH-SubframeSet2-r12 INTEGER (-8..7)

}

}

}

UplinkPowerControlDedicated-v1530 ::= SEQUENCE {

alpha-UE-r15 Alpha-r12 OPTIONAL, -- Need OR

p0-UE-PUSCH-r15 INTEGER (-16..15) OPTIONAL -- Need OR

}

UplinkPowerControlDedicatedSTTI-r15 ::= SEQUENCE {

accumulationEnabledSTTI-r15 BOOLEAN,

deltaTxD-OffsetListSPUCCH-r15 DeltaTxD-OffsetListSPUCCH-r15 OPTIONAL, -- Need OR

uplinkPower-CSIPayload BOOLEAN

}

UplinkPUSCH-LessPowerControlDedicated-v1430 ::= SEQUENCE {

p0-UE-PeriodicSRS-r14 INTEGER (-8..7) OPTIONAL, -- Need OR

p0-UE-AperiodicSRS-r14 INTEGER (-8..7) OPTIONAL, -- Need OR

accumulationEnabled-r14 BOOLEAN

}

UplinkPowerControlAddSRS-r16 ::= SEQUENCE {

tpc-IndexSRS-Add-r16 TPC-Index OPTIONAL, -- Need ON

startingBitOfFormat3B-SRS-Add-r16 INTEGER (0..31) OPTIONAL, -- Need ON

fieldTypeFormat3B-SRS-Add-r16 INTEGER (1..2) OPTIONAL, -- Need ON

p0-UE-SRS-Add-r16 INTEGER (-16..15) OPTIONAL, -- Need ON

accumulationEnabledSRS-Add-r16 BOOLEAN

}

UplinkPowerControlDedicatedSCell-r10 ::= SEQUENCE {

p0-UE-PUSCH-r10 INTEGER (-8..7),

deltaMCS-Enabled-r10 ENUMERATED {en0, en1},

accumulationEnabled-r10 BOOLEAN,

pSRS-Offset-r10 INTEGER (0..15),

pSRS-OffsetAp-r10 INTEGER (0..15) OPTIONAL, -- Need OR

filterCoefficient-r10 FilterCoefficient DEFAULT fc4,

pathlossReferenceLinking-r10 ENUMERATED {pCell, sCell}

}

UplinkPowerControlDedicatedSCell-v1310 ::= SEQUENCE {

--Release 8

p0-UE-PUCCH INTEGER (-8..7),

--Release 10

deltaTxD-OffsetListPUCCH-r10 DeltaTxD-OffsetListPUCCH-r10 OPTIONAL -- Need OR

}

DeltaFList-PUCCH ::= SEQUENCE {

deltaF-PUCCH-Format1 ENUMERATED {deltaF-2, deltaF0, deltaF2},

deltaF-PUCCH-Format1b ENUMERATED {deltaF1, deltaF3, deltaF5},

deltaF-PUCCH-Format2 ENUMERATED {deltaF-2, deltaF0, deltaF1, deltaF2},

deltaF-PUCCH-Format2a ENUMERATED {deltaF-2, deltaF0, deltaF2},

deltaF-PUCCH-Format2b ENUMERATED {deltaF-2, deltaF0, deltaF2}

}

DeltaFList-SPUCCH-r15 ::= CHOICE {

release NULL,

setup SEQUENCE {

deltaF-slotSPUCCH-Format1-r15 ENUMERATED {deltaF-1, deltaF0, deltaF1, deltaF2,

deltaF3, deltaF4, deltaF5, deltaF6} OPTIONAL, --Need OR

deltaF-slotSPUCCH-Format1a-r15 ENUMERATED {deltaF1, deltaF2, deltaF3, deltaF4,

deltaF5, deltaF6, deltaF7, deltaF8} OPTIONAL, --Need OR

deltaF-slotSPUCCH-Format1b-r15 ENUMERATED {deltaF3, deltaF4, deltaF5, deltaF6,

deltaF7, deltaF8, deltaF9, deltaF10} OPTIONAL,--Need OR

deltaF-slotSPUCCH-Format3-r15 ENUMERATED {deltaF4, deltaF5, deltaF6, deltaF7,

deltaF8, deltaF9, deltaF10, deltaF11} OPTIONAL,--Need OR

deltaF-slotSPUCCH-RM-Format4-r15 ENUMERATED {deltaF13, deltaF14, deltaF15, deltaF16,

deltaF17, deltaF18, deltaF19, deltaF20} OPTIONAL,

--Need OR

deltaF-slotSPUCCH-TBCC-Format4-r15 ENUMERATED {deltaF10, deltaF11, deltaF12, deltaF13,

deltaF14, deltaF15, deltaF16, deltaF17} OPTIONAL,

--Need OR

deltaF-subslotSPUCCH-Format1and1a-r15 ENUMERATED {deltaF5, deltaF6, deltaF7, deltaF8,

deltaF9, deltaF10, deltaF11, deltaF12} OPTIONAL,

--Need OR

deltaF-subslotSPUCCH-Format1b-r15 ENUMERATED {deltaF6, deltaF7, deltaF8, deltaF9,

deltaF10, deltaF11, deltaF12, deltaF13} OPTIONAL,

--Need OR

deltaF-subslotSPUCCH-RM-Format4-r15 ENUMERATED {deltaF15, deltaF16, deltaF17, deltaF18,

deltaF19, deltaF20, deltaF21, deltaF22} OPTIONAL,

--Need OR

deltaF-subslotSPUCCH-TBCC-Format4-r15 ENUMERATED {deltaF10, deltaF11, deltaF12, deltaF13,

deltaF14, deltaF15, deltaF16, deltaF17} OPTIONAL,

--Need OR

...

}

}

DeltaTxD-OffsetListPUCCH-r10 ::= SEQUENCE {

deltaTxD-OffsetPUCCH-Format1-r10 ENUMERATED {dB0, dB-2},

deltaTxD-OffsetPUCCH-Format1a1b-r10 ENUMERATED {dB0, dB-2},

deltaTxD-OffsetPUCCH-Format22a2b-r10 ENUMERATED {dB0, dB-2},

deltaTxD-OffsetPUCCH-Format3-r10 ENUMERATED {dB0, dB-2},

...

}

DeltaTxD-OffsetListPUCCH-v1130 ::= SEQUENCE {

deltaTxD-OffsetPUCCH-Format1bCS-r11 ENUMERATED {dB0, dB-1}

}

DeltaTxD-OffsetListSPUCCH-r15 ::= SEQUENCE {

deltaTxD-OffsetSPUCCH-Format1-r15 ENUMERATED {dB0, dB-2},

deltaTxD-OffsetSPUCCH-Format1a-r15 ENUMERATED {dB0, dB-2},

deltaTxD-OffsetSPUCCH-Format1b-r15 ENUMERATED {dB0, dB-2},

deltaTxD-OffsetSPUCCH-Format3-r15 ENUMERATED {dB0, dB-2},

...

}

-- ASN1STOP

| *UplinkPowerControl* field descriptions |
| --- |
| ***accumulationEnabled, accumulationEnabledSTTI***  Parameter: Accumulation-enabled, see TS 36.213 [23], clauses 5.1.1.1 and 5.1.3.1. TRUE corresponds to "enabled" whereas FALSE corresponds to "disabled". |
| ***accumulationEnabledSRS-Add***  Parameter: accumulationEnabled-additionalSRS, see TS 36.213 [23], clauses 5.1.3.1. TRUE corresponds to "enabled" whereas FALSE corresponds to "disabled". |
| ***alpha***  Parameter: *α* See TS 36.213 [23], clause 5.1.1.1. This field applies for uplink power control subframe set 1 if uplink power control subframe sets are configured by *tpc-SubframeSet*. |
| ***alpha-SRS, alphaSRS-Add***  Parameter: *αSRS*. See TS 36.213 [23], clause 5.1.3.1. *alpha-SRS* applies for SRS power control on a PUSCH-less SCell, *alphaSRS-Add* applies for SRS power control on the additional SRS symbols. |
| ***alpha-SubframeSet2***  Parameter: *α*. See TS 36.213 [23], clause 5.1.1.1. This field applies for uplink power control subframe set 2 if uplink power control subframe sets are configured by *tpc-SubframeSet*. |
| ***alpha-UE***  Parameter: *αUE* See TS 36.213 [23], clause 5.1.1.1. |
| ***deltaF-PUCCH-FormatX***  Parameter:  for the PUCCH formats 1, 1b, 2, 2a, 2b, 3, 4, 5 and 1b with channel selection. See TS 36.213 [23], clause 5.1.2, where deltaF-2 corresponds to -2 dB, deltaF0 corresponds to 0 dB and so on. |
| ***deltaF-PUCCH-FormatX, deltaF-slotSPUCCH-FormatX, deltaF-subslotSPUCCH-FormatX***  Parameter:  for the SPUCCH formats 1, 1a, 1b, 3 and 4. See TS 36.213 [23], clause 5.1.2 where deltaF-2 corresponds to -2 dB, deltaF0 corresponds to 0 dB and so on. In case both an A and a B configuration exist, configuration A is used in case SPUCCH carries ≤ 22 HARQ-ACK bits, and B otherwise. |
| ***deltaMCS-Enabled***  Parameter: *Ks* See TS 36.213 [23], clause 5.1.1.1. en0 corresponds to value 0 corresponding to state "disabled". en1 corresponds to value 1.25 corresponding to "enabled". |
| ***deltaPreambleMsg3***  Parameter:  *see* TS 36.213 [23], clause 5.1.1.1. Actual value = field value \* 2 [dB]. |
| ***deltaTxD-OffsetPUCCH-FormatX***  Parameter:  for the PUCCH formats 1, 1a/1b, 1b with channel selection, 2/2a/2b and 3 when two antenna ports are configured for PUCCH transmission. See TS 36.213 [23], clause 5.1.2.1, where dB0 corresponds to 0 dB, dB-1 corresponds to -1 dB, dB-2 corresponds to -2 dB. EUTRAN configures the field *deltaTxD-OffsetPUCCH-Format1bCS-r11* for the PCell and/or the PSCell only. |
| ***deltaTxD-OffsetSPUCCH-FormatX***  Parameter:  for the SPUCCH formats 1, 1a/1b, 1b with channel selection and 3 when two antenna ports are configured for SPUCCH transmission. See TS 36.213 [23], clause 5.1.2.1 where dB0 corresponds to 0 dB, dB-1 corresponds to -1 dB, dB-2 corresponds to -2 dB. |
| ***fieldTypeFormat3B-SRS-Add***  Indicates the field width of power control field in DCI format 3B for additional SRS. See TS 36.212 [22], clause 5.3.3.1.7A. |
| ***filterCoefficient***  Specifies the filtering coefficient for RSRP measurements used to calculate path loss, as specified in TS 36.213 [23], clause 5.1.1.1. The same filtering mechanism applies as for *quantityConfig* described in 5.5.3.2. |
| ***p0-Nominal-AperiodicSRS***  Parameter:  where *m*=1. See TS 36.213 [23], clause 5.1.3.1, unit dBm. |
| ***p0-Nominal-PeriodicSRS***  Parameter:  where *m*=0. See TS 36.213 [23], clause5.1.3.1, unit dBm. |
| ***p0-NominalPUCCH***  Parameter:  See TS 36.213 [23], clause 5.1.2.1, unit dBm. |
| ***p0-NominalPUSCH***  Parameter:  See TS 36.213 [23], clause 5.1.1.1, unit dBm. This field is applicable for non-persistent scheduling only. This field applies for uplink power control subframe set 1 if uplink power control subframe sets are configured by *tpc-SubframeSet*. |
| ***p0-NominalPUSCH-SubframeSet2***  Parameter: . See TS 36.213 [23], clause 5.1.1.1, unit dBm. This field is applicable for non-persistent scheduling only. This field applies for uplink power control subframe set 2 if uplink power control subframe sets are configured by *tpc-SubframeSet*. |
| ***p0-NominalSRS-Add***  Parameter:  where *m*=2. See TS 36.213 [23], clause 5.1.3.1, unit dBm. |
| ***p0-UE-SRS-Add***  Parameter:  where *m*=2. See TS 36.213 [23], clause 5.1.3.1, unit dB. |
| ***p0-UE-AperiodicSRS***  Parameter:  where *m*=1. See TS 36.213 [23], clause 5.1.3.1, unit dB. |
| ***p0-UE-PeriodicSRS***  Parameter:  where *m*=0. See TS 36.213 [23], clause 5.1.3.1, unit dB. |
| ***p0-UE-PUCCH***  Parameter:  See TS 36.213 [23], clause 5.1.2.1. Unit dB |
| ***p0-UE-PUSCH***  Parameter:  See TS 36.213 [23], clause 5.1.1.1, unit dB. This field is applicable for non-persistent scheduling, only. This field applies for uplink power control subframe set 1 if uplink power control subframe sets are configured by *tpc-SubframeSet*. If *p0-UE-PUSCH-r15* is included, the UE ignores *p0-UE-PUSCH* (i.e., without suffix). |
| ***p0-UE-PUSCH-SubframeSet2***  Parameter:  See TS 36.213 [23], clause 5.1.1.1, unit dB. This field is applicable for non-persistent scheduling, only. This field applies for uplink power control subframe set 2 if uplink power control subframe sets are configured by *tpc-SubframeSet*. |
| ***pathlossReferenceLinking***  Indicates whether the UE shall apply as pathloss reference either the downlink of the PCell or of the SCell that corresponds with this uplink (i.e. according to the *cellIdentification* within the field *sCellToAddMod*). For SCells part of an STAG E-UTRAN sets the value to sCell. |
| ***pSRS-Offset, pSRS-OffsetAp***  Parameter: *PSRS\_OFFSET* for periodic and aperiodic sounding reference signal transmission repectively. See TS 36.213 [23], clause 5.1.3.1. For *Ks*=1.25, the actual parameter value is *pSRS-Offset* value – 3. For *Ks*=0, the actual parameter value is -10.5 + 1.5\**pSRS-Offset* value.  If *pSRS-Offset-v1130* is included, the UE ignores *pSRS-Offset* (i.e., without suffix). Likewise, if *pSRS-OffsetAp-v1130* is included, the UE ignores *pSRS-OffsetAp-r10*. For *Ks*=0, E-UTRAN does not set values larger than 26. |
| ***startingBitOfFormat3B-SRS-Add***  Indicates the starting position of a block to trigger and TPC commands for the additional SRS symbols. See TS 36.212 [22], clause 5.3.3.1.7A. |
| ***tpc-IndexSRS-Add***  Indicates the index to the TPC command for the SRS in additional symbols. See TS 36.212 [22], clause 5.3.3.1.6 and 5.3.3.1.7. |
| ***tpc-SubframeSet***  Indicates the uplink subframes (including UpPTS in special subframes) of the uplink power control subframe sets. Value 0 means the subframe belongs to uplink power control subframe set 1, and value 1 means the subframe belongs to uplink power control subframe set 2. |
| ***uplinkPower-CSIPayload***  *TRUE* indicates that the UE shall derive BPRE based on the actual value of O\_CQI for slot/subslot-PUSCH, whereas *FALSE* indicates that the largest value of O\_CQI across all RI values shall be used for the derivation of BPRE for slot/subslot-PUSCH. |

#### *– WUS-Config*

The IE *WUS-Config* is used to specify the WUS configuration. For the UEs supporting WUS, E-UTRAN uses WUS to indicate that the UE shall attempt to receive paging in that cell, see TS 36.304 [4].

***WUS-Config* information element**

-- ASN1START

WUS-Config-r15 ::= SEQUENCE {

maxDurationFactor-r15 ENUMERATED {one32th, one16th, one8th, one4th},

numPOs-r15 ENUMERATED {n1, n2, n4, spare1} DEFAULT n1,

freqLocation-r15 ENUMERATED {n0, n2, n4, spare1},

timeOffsetDRX-r15 ENUMERATED {ms40, ms80, ms160, ms240},

timeOffset-eDRX-Short-r15 ENUMERATED {ms40, ms80, ms160, ms240},

timeOffset-eDRX-Long-r15 ENUMERATED {ms1000, ms2000} OPTIONAL -- Need OP

}

WUS-Config-v1560 ::= SEQUENCE {

powerBoost-r15 ENUMERATED {dB0, dB1dot8, dB3, dB4dot8}

}

WUS-Config-v16xy ::= SEQUENCE {

numDRX-CyclesRelaxed-r16 ENUMERATED {n1, n2, n4, n8}

}

-- ASN1STOP

| *WUS-Config* field descriptions |
| --- |
| ***freqLocation***  Frequency location of WUS within paging narrowband for BL UEs and UEs in CE. Value *n0* corresponds to WUS in the 1st and 2nd PRB, value *n2* represents the 3rd and 4th PRB, and value *n4* represents the 5th and 6th PRB. |
| ***maxDurationFactor***  Maximum WUS duration, expressed as a ratio of Rmax associated with Type 1-CSS, see TS 36.211 [21]. Value *one32th* corresponds to Rmax \* 1/32, value *one16th* corresponds to Rmax \* 1/16 and so on.  The value in TS 36.213 [23] considered by the UE is : maxDuration = Max (signalled value \* Rmax, 1) where Rmax is the value of *mpdcch-NumRepetitionPaging* for the carrier. |
| ***numDRX-CyclesRelaxed***  Maximum number of consecutive DRX cycles during which the UE can use WUS for synchronisation and skip serving cell measurements, see TS 36.133 [16]. Value n1 corresponds to 1 DRX cycle, value n2 corresponds to 2 DRX cycles and so on. |
| ***numPOs***  Number of consecutive Paging Occasions (PO) mapped to one WUS, applicable to UEs configured to use extended DRX, see TS 36.304 [4]. Value *n1* corresponds to 1 PO, value *n2* corresponds to 2 POs and so on. |
| ***powerBoost***  Power offset of WUS relative to CRS in dB, see TS 36.213 [23] clause 5.2. Value *db0* corresponds to 0dB, value *db1dot8* corresponds to 1.8dB, and so on. |
| ***timeOffsetDRX***  Minimum time gap in milliseconds from the end of the configured maximum WUS duration to the first associated PO, see TS 36.211 [21]. Value *ms40* corresponds to 40 ms, value *ms80* corresponds to 80 ms and so on. |
| ***timeOffset-eDRX-Short***  When eDRX is used, the short non-zero gap in milliseconds from the end of the configured maximum WUS duration to the associated PO, see TS 36.211 [21]. Value *ms40* corresponds to 40 ms, value *ms80* corresponds to 80 ms and so on.  E-UTRAN configures *timeOffset-eDRX-Short* to a value longer than or equal to *timeOffsetDRX*. |
| ***timeOffset-eDRX-Long***  When eDRX is used, the long non-zero gap in milliseconds from the end of the configured maximum WUS duration to the associated PO, see TS 36.211 [21]. Value *ms1000* corresponds to 1000 ms and value *ms2000* corresponds to 2000 ms.  If the field is absent, UE uses *timeOffset-eDRX-Short* for monitoring WUS. |

Next change

### 6.3.4 Mobility control information elements

<<unchanged text skipped>>

#### – *RSS-ConfigCarrierInfo*

The IE *RSS-ConfigCarrierInfo* contains RSS configuration for a carrier.

***RSS-ConfigCarrierInfo* information element**

-- ASN1START

RSS-ConfigCarrierInfo-r16::= SEQUENCE {

narrowbandIndex-r16 BIT STRING (SIZE (1..maxAvailNarrowBands-1-r16)),

timeOffsetGranularity-r16 ENUMERATED {g1, g2, g4, g8, g16, g32, g64, g128}

}

-- ASN1STOP

| ***RSS-ConfigCarrierInfo* field descriptions** |
| --- |
| ***narrowbandIndex***  Bitmap containing narrowbands used for RSS deployment in the carrier for CE mode A/B in RRC\_IDLE and RRC\_CONNECTED. Narrowbands including central 6 PRBs are excluded from the bitmap. |
| ***timeOffsetGranularity***  RSS Time Offset granularity (GRSS) for CE mode A/B in RRC\_IDLE and RRC\_CONNECTED, where the values of GRSS depend on the RSS periodicity PRSS as follows: Value *g1* corresponds to 1 frame, value *g2* corresponds to 2 frames, and so on.  GRSS = {1, 2, 4, 8, 16} frames for PRSS = 160 ms  GRSS = {1, 2, 4, 8, 16, 32} frames for PRSS = 320 ms  GRSS = {2, 4, 8, 16, 32, 64} frames for PRSS = 640 ms  GRSS = {4, 8, 16, 32, 64, 128} frames for PRSS = 1280 ms |

Next change

### 6.3.6 Other information elements

<<unchanged text skipped>>

Next changes

## 6.4 RRC multiplicity and type constraint values

### – Multiplicity and type constraint definitions

-- ASN1START

ffsValue INTEGER ::= 65536 -- Placeholder for all FFS value

hiFFS INTEGER ::= 64 -- Highest value of a range that still is FFS. To be removed.

maxAccessCat-1-r15 INTEGER ::= 63 -- Maximum number of Access Categories - 1

maxACDC-Cat-r13 INTEGER ::= 16 -- Maximum number of ACDC categories (per PLMN)

maxAvailNarrowBands-r13 INTEGER ::= 16 -- Maximum number of narrowbands

maxAvailNarrowBands-1-r16 INTEGER ::= 15 -- Maximum number of narrowbands minus one

maxBandComb-r10 INTEGER ::= 128 -- Maximum number of band combinations.

maxBandComb-r11 INTEGER ::= 256 -- Maximum number of additional band combinations.

maxBandComb-r13 INTEGER ::= 384 -- Maximum number of band combinations in Rel-13

maxBands INTEGER ::= 64 -- Maximum number of bands listed in EUTRA UE caps

maxBandsNR-r15 INTEGER ::= 1024 -- Maximum number of NR bands listed in EUTRA UE caps

maxBandwidthClass-r10 INTEGER ::= 16 -- Maximum number of supported CA BW classes per band

maxBandwidthCombSet-r10 INTEGER ::= 32 -- Maximum number of bandwidth combination sets per

-- supported band combination

maxBarringInfoSet-r15 INTEGER ::= 8 -- Maximum number of UAC barring information sets

maxBT-IdReport-r15 INTEGER ::= 32 -- Maximum number of Bluetooth IDs to report

maxBT-Name-r15 INTEGER ::= 4 -- Maximum number of Bluetooth name

maxCBR-Level-r14 INTEGER ::= 16 -- Maximum number of CBR levels

maxCBR-Level-1-r14 INTEGER ::= 15

maxCBR-Report-r14 INTEGER ::= 72 -- Maximum number of CBR results in a report

maxCBR-ReportNR-r16 INTEGER ::= 72 -- Maximum number of CBR results in a report for NR

-- sidelink communication

maxCDMA-BandClass INTEGER ::= 32 -- Maximum value of the CDMA band classes

maxCE-Level-r13 INTEGER ::= 4 -- Maximum number of CE levels

maxCellBlack INTEGER ::= 16 -- Maximum number of blacklisted physical cell identity

-- ranges listed in SIB type 4 and 5

maxCellHistory-r12 INTEGER ::= 16 -- Maximum number of visited EUTRA cells reported

maxCellInfoGERAN-r9 INTEGER ::= 32 -- Maximum number of GERAN cells for which system in-

-- formation can be provided as redirection assistance

maxCellInfoUTRA-r9 INTEGER ::= 16 -- Maximum number of UTRA cells for which system

-- information can be provided as redirection

-- assistance

maxCellMeasIdle-r15 INTEGER ::= 8 -- Maximum number of neighbouring inter-frequency

-- cells per carrier measured in RRC\_IDLE and RRC\_INACTIVE

maxCellMeasIdle-r16 INTEGER ::= 8 -- Value FFS

maxCombIDC-r11 INTEGER ::= 128 -- Maximum number of reported UL CA or

-- MR-DC combinations

maxCSI-IM-r11 INTEGER ::= 3 -- Maximum number of CSI-IM configurations

-- (per carrier frequency)

maxCSI-IM-r12 INTEGER ::= 4 -- Maximum number of CSI-IM configurations

-- (per carrier frequency)

minCSI-IM-r13 INTEGER ::= 5 -- Minimum number of CSI IM configurations from which

-- REL-13 extension is used

maxCSI-IM-r13 INTEGER ::= 24 -- Maximum number of CSI-IM configurations

-- (per carrier frequency)

maxCSI-IM-v1310 INTEGER ::= 20 -- Maximum number of additional CSI-IM configurations

-- (per carrier frequency)

maxCSI-Proc-r11 INTEGER ::= 4 -- Maximum number of CSI processes (per carrier

-- frequency)

maxCSI-RS-NZP-r11 INTEGER ::= 3 -- Maximum number of CSI RS resource

-- configurations using non-zero Tx power

-- (per carrier frequency)

minCSI-RS-NZP-r13 INTEGER ::= 4 -- Minimum number of CSI RS resource from which

-- REL-13 extension is used

maxCSI-RS-NZP-r13 INTEGER ::= 24 -- Maximum number of CSI RS resource

-- configurations using non-zero Tx power

-- (per carrier frequency)

maxCSI-RS-NZP-v1310 INTEGER ::= 21 -- Maximum number of additional CSI RS resource

-- configurations using non-zero Tx power

-- (per carrier frequency)

maxCSI-RS-ZP-r11 INTEGER ::= 4 -- Maximum number of CSI RS resource

-- configurations using zero Tx power(per carrier

-- frequency)

maxCQI-ProcExt-r11 INTEGER ::= 3 -- Maximum number of additional periodic CQI

-- configurations (per carrier frequency)

maxFreqUTRA-TDD-r10 INTEGER ::= 6 -- Maximum number of UTRA TDD carrier frequencies for

-- which system information can be provided as

-- redirection assistance

maxCellInter INTEGER ::= 16 -- Maximum number of neighbouring inter-frequency

-- cells listed in SIB type 5

maxCellIntra INTEGER ::= 16 -- Maximum number of neighbouring intra-frequency

-- cells listed in SIB type 4

maxCellListGERAN INTEGER ::= 3 -- Maximum number of lists of GERAN cells

maxCellMeas INTEGER ::= 32 -- Maximum number of entries in each of the

-- cell lists in a measurement object

maxCellReport INTEGER ::= 8 -- Maximum number of reported cells/CSI-RS resources

maxCellSFTD INTEGER ::= 3 -- Maximum number of cells for SFTD reporting

maxCondConfig-r16 INTEGER ::= 8 -- Maximum number of conditional configurations

maxConfigSPS-r14 INTEGER ::= 8 -- Maximum number of simultaneous SPS configurations

maxConfigSPS-r15 INTEGER ::= 6 -- Maximum number of simultaneous SPS configurations

-- configured with SPS C-RNTI

maxCSI-RS-Meas-r12 INTEGER ::= 96 -- Maximum number of entries in the CSI-RS list

-- in a measurement object

maxDRB INTEGER ::= 11 -- Maximum number of Data Radio Bearers

maxDRBExt-r15 INTEGER ::= 4 -- Maximum number of additional DRBs

maxDRB-r15 INTEGER ::= 15 -- Highest value of extended maximum number of DRBs

maxDS-Duration-r12 INTEGER ::= 5 -- Maximum number of subframes in a discovery signals

-- occasion

maxDS-ZTP-CSI-RS-r12 INTEGER ::= 5 -- Maximum number of zero transmission power CSI-RS for

-- a serving cell concerning discovery signals

maxEARFCN INTEGER ::= 65535 -- Maximum value of EUTRA carrier frequency

maxEARFCN-Plus1 INTEGER ::= 65536 -- Lowest value extended EARFCN range

maxEARFCN2 INTEGER ::= 262143 -- Highest value extended EARFCN range

maxEPDCCH-Set-r11 INTEGER ::= 2 -- Maximum number of EPDCCH sets

maxFBI INTEGER ::= 64 -- Maximum value of fequency band indicator

maxFBI-NR-r15 INTEGER ::= 1024 -- Highest value FBI range for NR.

maxFBI-Plus1 INTEGER ::= 65 -- Lowest value extended FBI range

maxFBI2 INTEGER ::= 256 -- Highest value extended FBI range

maxFeatureSets-r15 INTEGER ::= 256 -- Total number of feature sets (size of pool)

maxPerCC-FeatureSets-r15 INTEGER ::= 32 -- Total number of CC-specific feature sets

-- (size of the pool)

maxFFS INTEGER ::= 8 -- Maximum number value FFS

maxFreq INTEGER ::= 8 -- Maximum number of carrier frequencies

maxFreqIDC-r11 INTEGER ::= 32 -- Maximum number of carrier frequencies that are

-- affected by the IDC problems

maxFreqIdle-r15 INTEGER ::= 8 -- Maximum number of carrier frequencies for

-- IDLE mode measurements configured by eNB

maxFreqIdle-r16 INTEGER ::= 8 -- Value FFS

maxFreqMBMS-r11 INTEGER ::= 5 -- Maximum number of carrier frequencies for which an

-- MBMS capable UE may indicate an interest

maxFreqNBIOT-r16 INTEGER ::= 8 -- Maximum number of NB-IoT carrier frequencies that can

-- be provided as assistance information for inter-RAT

-- cell selection

maxFreqNR-r15 INTEGER ::= 5 -- Maximum number of NR carrier frequencies for

-- which a UE may provide measurement results upon

-- NR SCG failure

maxFreqSL-NR-r16 INTEGER ::= 8 -- Maximum number of NR anchor carrier frequencies on

-- which configurations for V2X sidelink communication

-- are provided

maxFreqV2X-r14 INTEGER ::= 8 -- Maximum number of carrier frequencies for which V2X

-- sidelink communication can be configured

maxFreqV2X-1-r14 INTEGER ::= 7 -- Highest index of frequencies

maxGERAN-SI INTEGER ::= 10 -- Maximum number of GERAN SI blocks that can be

-- provided as part of NACC information

maxGNFG INTEGER ::= 16 -- Maximum number of GERAN neighbour freq groups

maxGWUS-Groups-1-r16 INTEGER ::= 31 -- Maximum number of groups minus one for each

-- probability group

maxGWUS-Resources-r16 INTEGER ::= 4 -- Maximum number of GWUS resources for each group

maxGWUS-ProbThresholds-r16 INTEGER ::= 3 -- Maximum number of paging probability thresholds

maxIdleMeasCarriers-r15 INTEGER ::= 3 -- Maximum number of neighbouring inter-

-- frequency carriers measured in RRC\_IDLE and RRC\_INACTIVE

maxLCG-r13 INTEGER ::= 4 -- Maximum number of logical channel groups

maxLogMeasReport-r10 INTEGER ::= 520 -- Maximum number of logged measurement entries

-- that can be reported by the UE in one message

maxMBSFN-Allocations INTEGER ::= 8 -- Maximum number of MBSFN frame allocations with

-- different offset

maxMBSFN-Area INTEGER ::= 8

maxMBSFN-Area-1 INTEGER ::= 7

maxMBMS-ServiceListPerUE-r13 INTEGER ::= 15 -- Maximum number of services which the UE can

-- include in the MBMS interest indication

maxMeasId INTEGER ::= 32

maxMeasId-Plus1 INTEGER ::= 33

maxMeasId-r12 INTEGER ::= 64

maxMultiBands INTEGER ::= 8 -- Maximum number of additional frequency bands

-- that a cell belongs to

maxMultiBandsNR-r15 INTEGER ::= 32 -- Maximum number of additional NR frequency bands

-- that a cell belongs to

maxMultiBandsNR-1-r15 INTEGER ::= 31

maxNS-Pmax-r10 INTEGER ::= 8 -- Maximum number of NS and P-Max values per band

maxNAICS-Entries-r12 INTEGER ::= 8 -- Maximum number of supported NAICS combination(s)

maxNeighCell-r12 INTEGER ::= 8 -- Maximum number of neighbouring cells in NAICS

-- configuration (per carrier frequency)

maxNeighCell-SCPTM-r13 INTEGER ::= 8 -- Maximum number of SCPTM neighbour cells

maxNrofPCI-PerSMTC-r16 INTEGER ::= 64 -- Maximum number of PCIs per SMTC

maxNrofS-NSSAI-r15 INTEGER ::= 8 -- Maximum number of S-NSSAI

maxObjectId INTEGER ::= 32

maxObjectId-Plus1-r13 INTEGER ::= 33

maxObjectId-r13 INTEGER ::= 64

maxP-a-PerNeighCell-r12 INTEGER ::= 3 -- Maximum number of power offsets for a neighbour cell

-- in NAICS configuration

maxPageRec INTEGER ::= 16 --

maxPhysCellIdRange-r9 INTEGER ::= 4 -- Maximum number of physical cell identity ranges

maxPLMN-r11 INTEGER ::= 6 -- Maximum number of PLMNs

maxPLMN-1-r14 INTEGER ::= 5 -- Maximum number of PLMNs minus one

maxPLMN-r15 INTEGER ::= 8 -- Maximum number of PLMNs for RNA configuration

maxPLMN-NR-r15 INTEGER ::= 12 -- Maximum number of NR PLMNs

maxPNOffset INTEGER ::= 511 -- Maximum number of CDMA2000 PNOffsets

maxPMCH-PerMBSFN INTEGER ::= 15

maxPSSCH-TxConfig-r14 INTEGER ::= 16 -- Maximum number of PSSCH TX configurations

maxQuantSetsNR-r15 INTEGER ::= 2 -- Maximum number of NR quantity configuration sets

maxQCI-r13 INTEGER ::= 6 -- Maximum number of QCIs

maxRAT-Capabilities INTEGER ::= 8 -- Maximum number of interworking RATs (incl EUTRA)

maxRE-MapQCL-r11 INTEGER ::= 4 -- Maximum number of PDSCH RE Mapping configurations

-- (per carrier frequency)

maxReportConfigId INTEGER ::= 32

maxReservationPeriod-r14 INTEGER ::= 16 -- Maximum number of resource reservation periodicities

-- for sidelink V2X communication

maxRS-Index-r15 INTEGER ::= 64 -- Maximum number of RS indices

maxRS-Index-1-r15 INTEGER ::= 63 -- Highest value of RS index as used to identify

-- RS index in RRM reports.

maxRS-IndexCellQual-r15 INTEGER ::= 16 -- Maximum number of RS indices averaged to derive

-- cell quality for RRM.

maxRS-IndexReport-r15 INTEGER ::= 32 -- Maximum number of RS indices for RRM.

maxRSTD-Freq-r10 INTEGER ::= 3 -- Maximum number of frequency layers for RSTD

-- measurement

maxSAI-MBMS-r11 INTEGER ::= 64 -- Maximum number of MBMS service area identities

-- broadcast per carrier frequency

maxSCell-r10 INTEGER ::= 4 -- Maximum number of SCells

maxSCell-r13 INTEGER ::= 31 -- Highest value of extended number range of SCells

maxSCellGroups-r15 INTEGER ::= 4 -- Maximum number of SCell common parameter groups

maxSC-MTCH-r13 INTEGER ::= 1023 -- Maximum number of SC-MTCHs in one cell

maxSC-MTCH-BR-r14 INTEGER ::= 128 -- Maximum number of SC-MTCHs in one cell for feMTC

maxSL-CommRxPoolNFreq-r13 INTEGER ::= 32 -- Maximum number of individual sidelink communication

-- Rx resource pools on neighbouring freq

maxSL-CommRxPoolPreconf-v1310 INTEGER ::= 12 -- Maximum number of additional preconfigured

-- sidelink communication Rx resource pool entries

maxSL-TxPool-r12Plus1-r13 INTEGER ::= 5 -- First additional individual sidelink

-- Tx resource pool

maxSL-TxPool-v1310 INTEGER ::= 4 -- Maximum number of additional sidelink

-- Tx resource pool entries

maxSL-TxPool-r13 INTEGER ::= 8 -- Maximum number of individual sidelink

-- Tx resource pools

maxSL-CommTxPoolPreconf-v1310 INTEGER ::= 7 -- Maximum number of additional preconfigured

-- sidelink Tx resource pool entries

maxSL-Dest-r12 INTEGER ::= 16 -- Maximum number of sidelink destinations

maxSL-DiscCells-r13 INTEGER ::= 16 -- Maximum number of cells with similar sidelink

-- configurations

maxSL-DiscPowerClass-r12 INTEGER ::= 3 -- Maximum number of sidelink power classes

maxSL-DiscRxPoolPreconf-r13 INTEGER ::= 16 -- Maximum number of preconfigured sidelink

-- discovery Rx resource pool entries

maxSL-DiscSysInfoReportFreq-r13 INTEGER ::= 8 -- Maximum number of frequencies to include in a

-- SidelinkUEInformation for SI reporting

maxSL-DiscTxPoolPreconf-r13 INTEGER ::= 4 -- Maximum number of preconfigured sidelink

-- discovery Tx resource pool entries

maxSL-GP-r13 INTEGER ::= 8 -- Maximum number of gap patterns that can be requested

-- for a frequency or assigned

maxSL-PoolToMeasure-r14 INTEGER ::= 72 -- Maximum number of TX resource pools for CBR

-- measurement and report

maxSL-PoolToMeasureNR-r16 INTEGER ::= 8 -- Maximum number of resource pool for NR sidelink

-- measurement to measure for each measurement object

maxSL-Prio-r13 INTEGER ::= 8 -- Maximum number of entries in sidelink priority list

maxSL-RxPool-r12 INTEGER ::= 16 -- Maximum number of individual sidelink Rx resource pools

maxSL-Reliability-r15 INTEGER ::= 8 -- Maximum number of entries in sidelink reliability list

maxSL-SyncConfig-r12 INTEGER ::= 16 -- Maximum number of sidelink Sync configurations

maxSL-TF-IndexPair-r12 INTEGER ::= 64 -- Maximum number of sidelink Time Freq resource index

-- pairs

maxSL-TxPool-r12 INTEGER ::= 4 -- Maximum number of individual sidelink Tx resource pools

maxSL-V2X-RxPool-r14 INTEGER ::= 16 -- Maximum number of RX resource pools for

-- V2X sidelink communication

maxSL-V2X-RxPoolPreconf-r14 INTEGER ::= 16 -- Maximum number of RX resource pools for

-- V2X sidelink communication

maxSL-V2X-TxPool-r14 INTEGER ::= 8 -- Maximum number of TX resource pools for

-- V2X sidelink communication

maxSL-V2X-TxPoolPreconf-r14 INTEGER ::= 8 -- Maximum number of TX resource pools for

-- V2X sidelink communication

maxSL-V2X-SyncConfig-r14 INTEGER ::= 16 -- Maximum number of sidelink Sync configurations

-- for V2X sidelink communication

maxSL-V2X-CBRConfig-r14 INTEGER ::= 4 -- Maximum number of CBR range configurations

-- for V2X sidelink communication congestion

-- control

maxSL-V2X-CBRConfig-1-r14 INTEGER ::= 3

maxSL-V2X-TxConfig-r14 INTEGER ::= 64 -- Maximum number of TX parameter configurations

-- for V2X sidelink communication congestion

-- control

maxSL-V2X-TxConfig-1-r14 INTEGER ::= 63

maxSL-V2X-CBRConfig2-r14 INTEGER ::= 8 -- Maximum number of CBR range configurations in

-- pre-configuration for V2X sidelink

-- communication congestion control

maxSL-V2X-CBRConfig2-1-r14 INTEGER ::= 7

maxSL-V2X-TxConfig2-r14 INTEGER ::= 128 -- Maximum number of TX parameter

-- configurations in pre-configuration for V2X

-- sidelink communication congestion control

maxSL-V2X-TxConfig2-1-r14 INTEGER ::= 127

maxSTAG-r11 INTEGER ::= 3 -- Maximum number of STAGs

maxServCell-r10 INTEGER ::= 5 -- Maximum number of Serving cells

maxServCell-r13 INTEGER ::= 32 -- Highest value of extended number range of Serving cells

maxServCellNR-r15 INTEGER ::= 16 -- Maximum number of NR serving cells

maxServiceCount INTEGER ::= 16 -- Maximum number of MBMS services that can be included

-- in an MBMS counting request and response

maxServiceCount-1 INTEGER ::= 15

maxSessionPerPMCH INTEGER ::= 29

maxSessionPerPMCH-1 INTEGER ::= 28

maxSIB INTEGER ::= 32 -- Maximum number of SIBs

maxSIB-1 INTEGER ::= 31

maxSI-Message INTEGER ::= 32 -- Maximum number of SI messages

maxSimultaneousBands-r10 INTEGER ::= 64 -- Maximum number of simultaneously aggregated bands

maxSubframePatternIDC-r11 INTEGER ::= 8 -- Maximum number of subframe reservation patterns

-- that the UE can simultaneously recommend to the

-- E-UTRAN for use.

maxTrafficPattern-r14 INTEGER ::= 8 -- Maximum number of periodical traffic patterns

-- that the UE can simultaneously report to the

-- E-UTRAN.

maxUTRA-FDD-Carrier INTEGER ::= 16 -- Maximum number of UTRA FDD carrier frequencies

maxUTRA-TDD-Carrier INTEGER ::= 16 -- Maximum number of UTRA TDD carrier frequencies

maxWayPoint-r15 INTEGER ::= 20 -- Maximum number of flight path information waypoints

maxWLAN-Id-r12 INTEGER ::= 16 -- Maximum number of WLAN identifiers

maxWLAN-Bands-r13 INTEGER ::= 8 -- Maximum number of WLAN bands

maxWLAN-Id-r13 INTEGER ::= 32 -- Maximum number of WLAN identifiers

maxWLAN-Channels-r13 INTEGER ::= 16 -- maximum number of WLAN channels used in

-- WLAN-CarrierInfo

maxWLAN-CarrierInfo-r13 INTEGER ::= 8 -- Maximum number of WLAN Carrier Information

maxWLAN-Id-Report-r14 INTEGER ::= 32 -- Maximum number of WLAN IDs to report

maxWLAN-Name-r15 INTEGER ::= 4 -- Maximum number of WLAN name

-- ASN1STOP

NOTE: The value of maxDRB aligns with SA2.

Editor's Note: The value of maxFreqNBIOT-r16 is FFS.

End of changes