**3GPP TSG-WG2 Meeting # 118-e *R2-220xxxx***

**Online, 09 – 20 May 2022**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **36.331** | **CR** | **4798** | **rev** | **1** | **Current version:** | **17.0.0** |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network | **X** | Core Network |  |

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|  | | | | | | | | | | |
| ***Title:*** | Addition of missing functionalities and corrections to support of Non-Terrestrial Network in NB-IoT and eMTC | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, HiSilicon | | | | | | | | | |
| ***Source to TSG:*** | R2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | LTE\_NBIOT\_eMTC\_NTN | | | | |  | ***Date:*** | | | 2022-05-31 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-17 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories 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-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Addition of missing functionalities and miscellaneous corrections to TS36.331 for IOT NTN | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | 1) include class 0 issues 5, 6, 7, 8 10, 11 and 12 (R2-2205209)  2) close Editor’s Notes 4, 5, 6.1, 7, 8, 9 and 10 (R2-2205327)  3) include RILs Z301, Q501, M501, O305, X501, E802, Z305, H006, H007, Y001, Z306, Z307, E803, E804, O309, B001, E805, H010, B003, H011, M503, H014, Z310, H019, H015, Z315, H018, B004, H020 (R2-2206089)  4) include agreements related to [offline-056] (RILs H001, H002, H003, H004, H005, X601) (R2-2206526)  5) include agreements related to [offline-050] (close Editor’s Notes 1, 2 and 6-2, and include RILs H012, H013, H016, H017) (R2-2206529)  6) include agreements related to [offline-057] (include RILs H000, O308, O310, C503, Q601) (R2-2206538)  7) include agreements related to [offline-051] (R2-2206538)  8) include agreements related to [offline-058] (close Editor’s Note 3) (R2-2206626)  8) include agreements related to [offline-49] (R2-2206533)  9) include NR agreements related to coarse location reporting for eMTC  10) include agreements on UE capabilities (R2-2206836) | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Non-Terrestrial Network in NB-IoT and eMTC is not fully supported. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 2, 3.1, 3.2, 5.2.1.1, 5.2.1.3, 5.2.2.3, 5.2.2.4, 5.2.2.5, 5.3.3.1d, 5.3.3.2, 5.3.3.21, 5.3.3.22, 5.3.3.4, 5.3.3.4a. 5.3.7.3, 5.3.7.5, 5.3.5.4, 5.3.X (new), 5.5.5.1, 5.6.3, 5.6.5.3, 6.6.3.1, 6.2.1, 6.2.2, 6.3.1, 6.3.2, 6.3.4, 6.3.5, 6.3.6, 6.4, 6.7.1, 6.7.2, 6.7.3.2, 6.7.3.6 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **x** |  | Other core specifications | | | | TS 36.306 CR 1851  TS 36.321 CR 1541 | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

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| --- |
| Beginning of changes |

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] Void.

[3] 3GPP TS 36.302: "Evolved Universal Terrestrial Radio Access (E-UTRA); Services provided by the physical layer ".

[4] 3GPP TS 36.304: "Evolved Universal Terrestrial Radio Access (E-UTRA); UE Procedures in Idle Mode".

[5] 3GPP TS 36.306 "Evolved Universal Terrestrial Radio Access (E-UTRA); UE Radio Access Capabilities".

[6] 3GPP TS 36.321: "Evolved Universal Terrestrial Radio Access (E-UTRA); Medium Access Control (MAC) protocol specification".

[7] 3GPP TS 36.322:"Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Link Control (RLC) protocol specification".

[8] 3GPP TS 36.323: "Evolved Universal Terrestrial Radio Access (E-UTRA); Packet Data Convergence Protocol (PDCP) Specification".

[9] 3GPP TS 36.300: "Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access (E-UTRAN); Overall description; Stage 2".

[10] 3GPP TS 22.011: "Service accessibility".

[11] 3GPP TS 23.122: "Non-Access-Stratum (NAS) functions related to Mobile Station (MS) in idle mode".

[12] 3GPP2 C.S0002-F v1.0: "Physical Layer Standard for cdma2000 Spread Spectrum Systems".

[13] ITU-T Recommendation X.680 (07/2002) "Information Technology - Abstract Syntax Notation One (ASN.1): Specification of basic notation" (Same as the ISO/IEC International Standard 8824-1).

[14] ITU-T Recommendation X.681 (07/2002) "Information Technology - Abstract Syntax Notation One (ASN.1): Information object specification" (Same as the ISO/IEC International Standard 8824-2).

[15] ITU-T Recommendation X.691 (07/2002) "Information technology - ASN.1 encoding rules: Specification of Packed Encoding Rules (PER)" (Same as the ISO/IEC International Standard 8825-2).

[16] 3GPP TS 36.133: "Evolved Universal Terrestrial Radio Access (E-UTRA); Requirements for support of radio resource management".

[17] 3GPP TS 25.101: "Universal Terrestrial Radio Access (UTRA); User Equipment (UE) radio transmission and reception (FDD)".

[18] 3GPP TS 25.102: "Universal Terrestrial Radio Access (UTRA); User Equipment (UE) radio transmission and reception (TDD)".

[19] 3GPP TS 25.331:"Universal Terrestrial Radio Access (UTRA); Radio Resource Control (RRC); Protocol specification".

[20] 3GPP TS 45.005: "Radio transmission and reception".

[21] 3GPP TS 36.211: "Evolved Universal Terrestrial Radio Access (E-UTRA); Physical Channels and Modulation".

[22] 3GPP TS 36.212: "Evolved Universal Terrestrial Radio Access (E-UTRA); Multiplexing and channel coding".

[23] 3GPP TS 36.213: "Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer procedures".

[24] 3GPP2 C.S0057-E v1.0: "Band Class Specification for cdma2000 Spread Spectrum Systems".

[25] 3GPP2 C.S0005-F v1.0: "Upper Layer (Layer 3) Signaling Standard for cdma2000 Spread Spectrum Systems".

[26] 3GPP2 C.S0024-C v2.0: "cdma2000 High Rate Packet Data Air Interface Specification".

[27] 3GPP TS 23.003: "Numbering, addressing and identification".

[28] 3GPP TS 45.008: "Radio subsystem link control".

[29] 3GPP TS 25.133: "Requirements for Support of Radio Resource Management (FDD)".

[30] 3GPP TS 25.123: "Requirements for Support of Radio Resource Management (TDD)".

[31] 3GPP TS 36.401: "Evolved Universal Terrestrial Radio Access (E-UTRA); Architecture description".

[32] 3GPP TS 33.401: "3GPP System Architecture Evolution (SAE); Security architecture".

[33] 3GPP2 A.S0008-C v4.0: "Interoperability Specification (IOS) for High Rate Packet Data (HRPD) Radio Access Network Interfaces with Session Control in the Access Network"

[34] 3GPP2 C.S0004-F v1.0: "Signaling Link Access Control (LAC) Standard for cdma2000 Spread Spectrum Systems"

[35] 3GPP TS 24.301: "Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3".

[36] 3GPP TS 44.060: "General Packet Radio Service (GPRS); Mobile Station (MS) - Base Station System (BSS) interface; Radio Link Control/Medium Access Control (RLC/MAC) protocol".

[37] 3GPP TS 23.041: "Technical realization of Cell Broadcast Service (CBS)".

[38] 3GPP TS 23.038: "Alphabets and Language".

[39] 3GPP TS 36.413: "Evolved Universal Terrestrial Radio Access (E-UTRAN); S1 Application Protocol (S1 AP)".

[40] 3GPP TS 25.304: "Universal Terrestrial Radio Access (UTRAN); User Equipment (UE) procedures in idle mode and procedures for cell reselection in connected mode".

[41] 3GPP TS 23.401: "General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access".

[42] 3GPP TS 36.101: "Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception".

[43] 3GPP TS 45.005: "GSM/EDGE Radio transmission and reception".

[44] 3GPP2 C.S0087-A v2.0: "E-UTRAN - cdma2000 HRPD Connectivity and Interworking Air Interface Specification"

[45] 3GPP TS 44.018: "Mobile radio interface layer 3 specification; Radio Resource Control (RRC) protocol".

[46] 3GPP TS 25.223: "Spreading and modulation (TDD)".

[47] 3GPP TS 36.104: "Evolved Universal Terrestrial Radio Access (E-UTRA); Base Station (BS) radio transmission and reception".

[48] 3GPP TS 36.214: "Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer - Measurements".

[49] 3GPP TS 24.008: "Mobile radio interface layer 3 specification; Core network protocols; Stage 3".

[50] 3GPP TS 45.010: "Radio subsystem synchronization".

[51] 3GPP TS 23.272: "Circuit Switched Fallback in Evolved Packet System; Stage 2".

[52] 3GPP TS 29.061: "Interworking between the Public Land Mobile Network (PLMN) supporting packet based services and Packet Data Networks (PDN)".

[53] 3GPP2 C.S0097-0 v3.0: "E-UTRAN - cdma2000 1x Connectivity and Interworking Air Interface Specification".

[54] 3GPP TS 36.355: "LTE Positioning Protocol (LPP)".

[55] 3GPP TS 36.216: "Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer for relaying operation".

[56] 3GPP TS 23.246: "Multimedia Broadcast/Multicast Service (MBMS); Architecture and functional description".

[57] 3GPP TS 26.346: "Multimedia Broadcast/Multicast Service (MBMS); Protocols and codecs".

[58] 3GPP TS 32.422: "Telecommunication management; Subsriber and equipment trace; Trace control and confiuration management".

[59] 3GPP TS 22.368: "Service Requirements for Machine Type Communications; Stage 1".

[60] 3GPP TS 37.320: "Universal Terrestrial Radio Access (UTRA) and Evolved Universal Terrestrial Radio Access (E-UTRA); Radio measurement collection for Minimization of Drive Tests (MDT); Overall description; Stage 2".

[61] 3GPP TS 23.216: "Single Radio Voice Call Continuity (SRVCC); Stage 2".

[62] 3GPP TS 22.146: "Multimedia Broadcast/Multicast Service (MBMS); Stage 1".

[63] 3GPP TR 36.816: "Evolved Universal Terrestrial Radio Access (E-UTRA); Study on signalling and procedure for interference avoidance for in-device coexistence".

[64] IS-GPS-200F: "Navstar GPS Space Segment/Navigation User Segment Interfaces".

[65] 3GPP TS 25.307: "Requirement on User Equipments (UEs) supporting a release-independent frequency band".

[66] 3GPP TS 24.312: "Access Network Discovery and Selection Function (ANDSF) Management Object (MO)".

[67] IEEE 802.11-2012, Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) specifications, IEEE Std.

[68] 3GPP TS 23.303: "Proximity-based services (ProSe); Stage 2".

[69] 3GPP TS 24.334: "Proximity-services (ProSe) User Equipment (UE) to ProSe function protocol aspects; Stage 3".

[70] 3GPP TS 24.333: "Proximity-services (ProSe) Management Objects (MO)".

[71] 3GPP TS 36.314: "Evolved Universal Terrestrial Radio Access (E-UTRA); Layer 2- Measurements".

[72] 3GPP TS 24.105: "Application specific Congestion control for Data Communication (ACDC) Management Object (MO)".

[73] 3GPP TS 23.179: "Functional architecture and information flows to support mission critical communication services; Stage 2".

[74] 3GPP TS 24.302: "Access to the 3GPP Evolved Packet Core (EPC) via non-3GPP access networks".

[75] 3GPP TS 23.402: "Architecture enhancements for non-3GPP accesses; Stage-2".

[76] Wi-Fi Alliance® Technical Committee, Hotspot 2.0 Technical Task Group Hotspot 2.0 (Release 2) Technical Specification Version 3.11.

[77] 3GPP TS 22.101: "Service aspects; Service principles".

[78] 3GPP TS 23.285: "Technical Specification Group Services and System Aspects; Architecture enhancements for V2X services".

[79] 3GPP TS 36.307: "Evolved Universal Terrestrial Radio Access (E-UTRA); Requirements on User Equipments (UEs) supporting a release-independent frequency band".

[80] Military Standard WGS84 Metric MIL-STD-2401 (11 January 1994): "Military Standard Department of Defence World Geodetic System (WGS)".

[81] 3GPP TS 37.340: "NR; Multi-connectivity; Overall description; Stage-2".

[82] 3GPP TS 38.331: "NR; Radio Resource Control (RRC); Protocol specification".

[83] 3GPP TS 38.323: "NR; Packet Data Convergence Protocol (PDCP) Specification".

[84] 3GPP TS 38.133: "NR; Requirements for support of radio resource management".

[85] 3GPP TS 38.101-1: "NR; User Equipment (UE) radio transmission and reception; Part 1: Range 1 Standalone ".

[86] 3GPP TS 33.501: "Security Architecture and Procedures for 5G System".

[87] 3GPP TS 38.306: "NR; UE Radio Access Capabilities".

[88] 3GPP TS 38.213: "NR; Physical layer procedures for control".

[89] 3GPP TS 38.215: "NR; Physical layer measurements".

[90] 3GPP TS 26.247: "Transparent end-to-end Packet-switched Streaming Service (PSS); Progressive Download and Dynamic Adaptive Streaming over HTTP (3GP-DASH)".

[91] 3GPP TS 38.104: "NR; Base Station (BS) radio transmission and reception".

[92] 3GPP TS 38.304: "NR; User Equipment (UE) procedures in Idle mode and RRC Inactive state".

[93] Bluetooth Special Interest Group: "Bluetooth Core Specification v5.0", December 2016.

[94] 3GPP TS 37.213: "Physical layer procedures for shared spectrum channel access".

[95] 3GPP TS 24.501: "Non-Access-Stratum (NAS) protocol for 5G System (5GS); Stage 3".

[96] 3GPP TS 22.261: "Service requirements for the 5G System".

[97] 3GPP TS 37.324: "Service Data Adaptation Protocol (SDAP) specification".

[98] ATIS 0700041: "WEA 3.0: Device-Based Geo-Fencing".

[99] 3GPP TS 26.114: "IP Multimedia Subsystem (IMS); Multimedia Telephony; Media handling and interaction ".

[100] 3GPP TS 38.101-2: "NR; User Equipment (UE) radio transmission and reception; Part 2: Range 2 Standalone ".

[101] 3GPP TS 38.101-3: "NR; User Equipment (UE) radio transmission and reception; Part 3: Range 1 and Range 2 Interworking operation with other radios".

[102] 3GPP TS 23.502: "Procedures for the 5G System; Stage 2".

[103] 3GPP TS 38.314: "NR; layer 2 measurements".

[104] 3GPP TS 23.287: "Architecture enhancements for 5G System (5GS) to support Vehicle-to-Everything (V2X) services ".

[105] 3GPP TS 38.472: "NG-RAN; F1 signalling transport".

[106] 3GPP TS 38.300: "NR; Overall description; Stage 2".

[107] 3GPP TS 38.174: "NR; Integrated access and backhaul radio transmission and reception".

[108] 3GPP TS 36.423: "Evolved Universal Terrestrial Radio Access Network (E-UTRAN); X2 Application Protocol (X2AP)".

[109] 3GPP TS 37.355: "LTE Positioning Protocol (LPP)".

[110] NIMA TR 8350.2, Third Edition, Amendment 1, 3 January 2000: "DEPARTMENT OF DEFENSE WORLD GEODETIC SYSTEM 1984".

[X1] “Recommendation for Space Data System Standards: ORBIT DATA MESSAGES”, BLUE BOOK CCSDS 502.0-B-2, The Consultative Committee for Space Data Systems, November 2009.

# 3 Definitions, symbols and abbreviations

## 3.1 Definitions

For the purposes of the present document, the terms and definitions given in TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in TR 21.905 [1].

**Anchor carrier:** In NB-IoT, a carrier where the UE assumes that NPSS/NSSS/NPBCH/SIB-NB for FDD or NPSS/NSSS/NPBCH for TDD are transmitted.

**Bandwidth Reduced:** Refers to operation in downlink and uplink with a limited channel bandwidth of 6 PRBs.

**CEIL:** Mathematical function used to 'round up' i.e. to the nearest integer having a higher or equal value.

**Cellular IoT EPS Optimisation**: Provides improved support of small data transfer, as defined in TS 24.301 [35].

**Commercial Mobile Alert System:** Public Warning System that delivers *Warning Notifications* provided by *Warning Notification Providers* to CMAS capable UEs.

**Common access barring parameters:** The common access barring parameters refer to the access class barring parameters that are broadcast in *SystemInformationBlockType2* outside the list of PLMN specific parameters (i.e. in *ac-BarringPerPLMN-List*).

**Control plane CIoT 5GS optimisation:** Enables support of efficient transport of user data (IP, Ethernet or unstructured) or SMS messages over control plane via the AMF without triggering data radio bearer establishment, as defined in TS 24.501 [95].

**Control plane CIoT EPS optimisation**: Enables support of efficient transport of user data (IP, non-IP or SMS) over control plane via the MME without triggering data radio bearer establishment, as defined in TS 24.301 [35].

**Control plane EDT**: Early Data Transmission used with the Control plane CIoT EPS optimisation or Control plane CIoT 5GS optimisation.

**CSG member cell:** A cell broadcasting the identity of the selected PLMN, registered PLMN or equivalent PLMN and for which the Permitted CSG list of the UE includes an entry comprising cell's CSG ID and the respective PLMN identity.

**DAPS bearer**: A bearer whose radio protocols are located in both the source eNB and the target eNB during a DAPS handover to use both source eNB and target eNB resources.

**Dual Connectivity**: A UE in RRC\_CONNECTED is configured with Dual Connectivity when configured with a Master and a Secondary Cell Group.

**Early Data Transmission:** Allows one uplink data transmission optionally followed by one downlink data transmission during the random access procedure as specified in TS 36.300 [9]. The S1 connection is established or resumed upon reception of the uplink data and may be released or suspended along with the transmission of the downlink data. Early data transmission refers to both CP-EDT and UP-EDT.

**Early Security Reactivation:** Re-activation of AS security prior to the transmission of *RRCConnectionResumeRequest* message when a UE is provided with an NCC value during suspension.

**Ephemeris:** A set of parameters that describe the movement of an NTN node over time.

**E-UTRA-NR Dual Connectivity:** A form of dual connectivity in which a UE in RRC\_CONNECTED is configured with MCG cells using E-UTRA and SCG cells using NR as defined in TS 37.340 [81].

**EU-Alert:** Public Warning System that delivers Warning Notifications provided by Warning Notification Providers using the same AS mechanisms as defined for CMAS.

**Field:** The individual contents of an information element are referred as fields.

**FLOOR:** Mathematical function used to 'round down' i.e. to the nearest integer having a lower or equal value.

**FR1:** Frequency range 1 as defined in clause 5.1 of TS 38.101-1 [85].

**FR2:** Frequency range 2 as defined in clause 5.1 of TS 38.101-2 [100].

**Geosynchronous Orbit:** Earth-centred orbit at approximately 35,786 kilometres in altitude above Earth’s surface and synchronised with Earth’s rotation. A geostationary orbit is a non-inclined geosynchronous orbit, i.e in the Earth’s equator plane.

**Information element:** A structural element containing a single or multiple fields is referred as information element.

**Korean Public Alert System (KPAS):** Public Warning System that delivers Warning Notifications provided by Warning Notification Providers using the same AS mechanisms as defined for CMAS.

**Master Cell Group**: For a UE not configured with DC, the MCG comprises all serving cells. For a UE configured with DC, the MCG concerns a subset of the serving cells comprising of the PCell and zero or more secondary cells.

**Mixed Operation Mode:** In NB-IoT FDD, multi-carrier operation where the anchor carrier is in standalone mode while the non-anchor carrier is in inband or guardand mode, and vice versa. See TS 36.300 [9].

**MBMS service:** MBMS bearer service as defined in TS 23.246 [56] (i.e. provided via an MRB or an SC-MRB).

**NB-IoT:** NB-IoT allows access to network services via E-UTRA with a channel bandwidth limited to 200 kHz.

**NB-IoT UE:** A UE that uses NB-IoT.

**NCSG:** Network controlled small gap as defined in TS 36.133 [16].

**Non-geosynchronous orbit:** Earth-centred orbit with an orbital period that does not match Earth’s rotation on its axis. This includes Low Earth Orbit (LEO) and Medium Earth Orbit (MEO).

**Non-terrestrial networks:** An E-UTRAN consisting of eNBs, which provide non-terrestrial LTE access to UEs by means of an NTN payload embarked on a space-borne NTN vehicle and an NTN Gateway.

**NR-E-UTRA Dual Connectivity (NE-DC):** A form of dual connectivity in which a UE in RRC\_CONNECTED is configured with MCG cells using NR and SCG cells using E-UTRA as defined in TS 37.340 [81].

**Non-anchor carrier:** In NB-IoT, a carrier where the UE does not assume that NPSS/NSSS/NPBCH/SIB-NB for FDD or NPSS/NSSS/NPBCH for TDD are transmitted.

**NR Carrier Frequency:** Frequency referring to the position of resource element RE=#0 (subcarrier #0) of resource block RB#10 of the SS block.

**NR sidelink communication**: AS functionality enabling at least V2X Communication as defined in TS 23.287 [104], between two or more nearby UEs, using NR technology but not traversing any network node.

**Primary Cell**: The cell, operating on the primary frequency, in which the UE either performs the initial connection establishment procedure or initiates the connection re-establishment procedure, or the cell indicated as the primary cell in the handover procedure.

**Primary Secondary Cell**: The SCG cell in which the UE is instructed to perform random access or initial PUSCH transmission if random access procedure is skipped when performing the SCG change procedure.

**Primary Timing Advance Group**: Timing Advance Group containing the PCell or the PSCell.

**PUCCH SCell:** An SCell configured with PUCCH.

**Quasi-earth fixed cell:** An NTN cell fixed with respect to a certain geographic area on the earth during a certain time duration. This can be provided by beam(s) covering one geographic area for a finite period and a different geographic area during another period (e.g., the case of NGSO satellites generating steerable beams).

**RLC bearer configuration:** The lower layer part of the radio bearer configuration comprising the RLC and logical channel configurations.

**Satellite:** A space-borne vehicle orbiting the Earth that carries the NTN payload.

**Secondary Cell**: A cell, operating on a secondary frequency, which may be configured once an RRC connection is established and which may be used to provide additional radio resources. Except for the case of (NG)EN-DC, the PSCell is considered to be an SCell.

**Secondary Cell Group**: For a UE configured with DC, the subset of serving cells not part of the MCG, i.e. comprising of the PSCell and zero or more other secondary cells.

**Secondary Timing Advance Group**: Timing Advance Group neither containing the PCell nor the PSCell. A secondary timing advance group contains at least one cell with configured uplink.

**Serving Cell**: For a UE in RRC\_CONNECTED not configured with CA/ DC there is only one serving cell comprising of the primary cell. For a UE in RRC\_CONNECTED configured with CA/ DC the term 'serving cells' is used to denote the set of one or more cells comprising of the primary cell and all secondary cells.

**Sidelink**: UE to UE interface for sidelink communication, V2X sidelink communication and sidelink discovery. The sidelink corresponds to the PC5 interface as defined in TS 23.303 [68].

**Sidelink communication**: AS functionality enabling ProSe Direct Communication as defined in TS 23.303 [68], between two or more nearby UEs, using E-UTRA technology but not traversing any network node. In this version, the terminology "sidelink communication" without "V2X" prefix only concerns PS unless specifically stated otherwise.

**Sidelink discovery**: AS functionality enabling ProSe Direct Discovery as defined in TS 23.303 [68], using E-UTRA technology but not traversing any network node.

**Sidelink operation**: Includes sidelink communication, V2X sidelink communication and sidelink discovery.

**Split SRB**: in MR-DC, an SRB between the MN and the UE, allowing selection of either the direct path or the path via the SN as well as duplication of RRC PDUs across both paths as defined in TS 37.340 [81].

**Timing Advance Group**: A group of serving cells that is configured by RRC and that, for the cells with an UL configured, use the same timing reference cell and the same Timing Advance value. A Timing Advance Group only includes cells of the same cell group i.e. it either includes MCG cells or SCG cells.

**Transmission using PUR:** Allows one uplink data transmission using preconfigured uplink resource from RRC\_IDLE mode as specified in TS 36.300 [9]. Transmission using PUR refers to both CP transmission using PUR and UP transmission using PUR.

**UE Inactive AS Context:** UE Inactive AS Context is stored when the connection is suspended and restored when the connection is resumed. It includes information as defined in clause 5.3.8.7.

**UE in CE:** Refers to a UE that is capable of using coverage enhancement, and requires coverage enhancement mode to access a cell or is configured in a coverage enhancement mode.

**User plane CIoT 5GS optimisation:** Enables support for change from 5GMM-IDLE mode to 5GMM-CONNECTED mode without the need for using the Service Request procedure, as defined in TS 24.501 [95].

**User plane CIoT EPS optimisation**: Enables support for change from EMM-IDLE mode to EMM-CONNECTED mode without the need for using the Service Request procedure, as defined in TS 24.301 [35].

**User plane EDT:** Early Data Transmission used with the User plane CIoT EPS optimisation or User plane CIoT 5GS optimisation.

**V2X sidelink communication**: AS functionality enabling V2X Communication as defined in TS 23.285 [78], between nearby UEs, using E-UTRA technology but not traversing any network node.

## 3.2 Abbreviations

For the purposes of the present document, the abbreviations given in TR 21.905 [1], TS 36.300 [9] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in TR 21.905 [1] or TS 36.300 [9].

1xRTT CDMA2000 1x Radio Transmission Technology

AB Access Barring

ACDC Application specific Congestion control for Data Communication

ACK Acknowledgement

AILC Assistance Information bit for Local Cache

AM Acknowledged Mode

ANDSF Access Network Discovery and Selection Function

ARQ Automatic Repeat Request

AS Access Stratum

ASN.1 Abstract Syntax Notation One

AUL Autonomous Uplink

BCCH Broadcast Control Channel

BCD Binary Coded Decimal

BCH Broadcast Channel

BL Bandwidth reduced Low complexity

BLER Block Error Rate

BR Bandwidth Reduced

BR-BCCH Bandwidth Reduced Broadcast Control Channel

CA Carrier Aggregation

CAS Cell Acquisition Subframes

CBR Channel Busy Ratio

CCCH Common Control Channel

CCO Cell Change Order

CE Coverage Enhancement

CFI Control Format Indicator

CG Cell Group

CHO Conditional Handover

CIoT Cellular IoT

CMAS Commercial Mobile Alert Service

CP Control Plane

CPA Conditional PSCell Addition

CPC Conditional PSCell Change

CP-EDT Control Plane EDT

C-RNTI Cell RNTI

CRS Cell-specific Reference Signal

CSFB CS fallback

CSG Closed Subscriber Group

CSI Channel State Information

DAPS Dual Active Protocol Stack

DC Dual Connectivity

DCCH Dedicated Control Channel

DCI Downlink Control Information

DCN Dedicated Core Networks

DFN Direct Frame Number

DL Downlink

DL-SCH Downlink Shared Channel

DRB (user) Data Radio Bearer

DRX Discontinuous Reception

DTCH Dedicated Traffic Channel

EAB Extended Access Barring

eDRX Extended DRX

EDT Early Data Transmission

EHPLMN Equivalent Home Public Land Mobile Network

eIMTA Enhanced Interference Management and Traffic Adaptation

ENB Evolved Node B

EN-DC E-UTRA NR Dual Connectivity with E-UTRAN connected to EPC

EPC Evolved Packet Core

EPDCCH Enhanced Physical Downlink Control Channel

EPS Evolved Packet System

ETWS Earthquake and Tsunami Warning System

E-UTRA Evolved Universal Terrestrial Radio Access

E-UTRA/5GC E-UTRA connected to 5GC

E-UTRA/EPC E-UTRA connected to EPC

E-UTRAN Evolved Universal Terrestrial Radio Access Network

FDD Frequency Division Duplex

FFS For Further Study

GERAN GSM/EDGE Radio Access Network

GNSS Global Navigation Satellite System

G-RNTI Group RNTI

GSM Global System for Mobile Communications

GSO Geosynchronous Orbit

GWUS Group Wake Up Signal

HARQ Hybrid Automatic Repeat Request

HFN Hyper Frame Number

HPLMN Home Public Land Mobile Network

HRPD CDMA2000 High Rate Packet Data

HSDN High Speed Dedicated Network

H-SFN Hyper SFN

IAB Integrated Access and Backhaul

IAB-DU IAB-node DU

IAB-MT IAB Mobile Termination

IDC In-Device Coexistence

IE Information element

IMEI International Mobile Equipment Identity

IMSI International Mobile Subscriber Identity

IoT Internet of Things

ISM Industrial, Scientific and Medical

kB Kilobyte (1000 bytes)

L1 Layer 1

L2 Layer 2

L3 Layer 3

LAA Licensed-Assisted Access

LWA LTE-WLAN Aggregation

LWAAP LTE-WLAN Aggregation Adaptation Protocol

LWIP LTE-WLAN Radio Level Integration with IPsec Tunnel

MAC Medium Access Control

MBMS Multimedia Broadcast Multicast Service

MBSFN Multimedia Broadcast multicast service Single Frequency Network

MCG Master Cell Group

MCOT Maximum Channel Occupancy Time

MCPTT Mission Critical Push To Talk

MDT Minimization of Drive Tests

MIB Master Information Block

MO Mobile Originating

MPDCCH MTC Physical Downlink Control Channel

MRB MBMS Point to Multipoint Radio Bearer

MR-DC Multi-Radio Dual Connectivity

MRO Mobility Robustness Optimisation

MSI MCH Scheduling Information

MT Mobile Terminating

MTSI Multimedia Telephony Service for IMS

MUST MultiUser Superposition Transmission

N/A Not Applicable

NACC Network Assisted Cell Change

NAICS Network Assisted Interference Cancellation/Suppression

NAS Non Access Stratum

NB-IoT NarrowBand Internet of Things

NE-DC NR E-UTRA Dual Connectivity

(NG)EN-DC E-UTRA NR Dual Connectivity (i.e. covering both EN-DC and NGEN-DC)

NGEN-DC E-UTRA NR Dual Connectivity with E-UTRAN connected to 5GC

NGSO Non-Geosynchronous Orbit

NPBCH Narrowband Physical Broadcast channel

NPDCCH Narrowband Physical Downlink Control channel

NPDSCH Narrowband Physical Downlink Shared channel

NPRACH Narrowband Physical Random Access channel

NPSS Narrowband Primary Synchronization Signal

NPUSCH Narrowband Physical Uplink Shared channel

NR NR Radio Access

NRS Narrowband Reference Signal

NSSAI Network Slice Selection Assistance Information

NSSS Narrowband Secondary Synchronization Signal

NTN Non-Terrestrial Network

OS OFDM Symbol

P2X Pedestrian-to-Everything

PCCH Paging Control Channel

PCell Primary Cell

PDCCH Physical Downlink Control Channel

PDCP Packet Data Convergence Protocol

PDU Protocol Data Unit

PLMN Public Land Mobile Network

PMK Pairwise Master Key

PO Paging Occasion

posSIB Positioning SIB

ProSe Proximity based Services

PS Public Safety (in context of sidelink), Packet Switched (otherwise)

PSCell Primary Secondary Cell

PSK Pre-Shared Key

PTAG Primary Timing Advance Group

PUCCH Physical Uplink Control Channel

PUR Preconfigured Uplink Resource

QCI QoS Class Identifier

QoE Quality of Experience

QoS Quality of Service

RACH Random Access CHannel

RAI Release Assistance Indication

RAT Radio Access Technology

RB Radio Bearer

RCLWI RAN Controlled LTE-WLAN Integration

RLC Radio Link Control

RLOS Restricted Local Operator Services

RMTC RSSI Measurement Timing Configuration

RN Relay Node

RNA RAN-based Notification Area

RNAU RAN-based Notification Area Update

RNTI Radio Network Temporary Identifier

ROHC RObust Header Compression

RPLMN Registered Public Land Mobile Network

RRC Radio Resource Control

RSCP Received Signal Code Power

RSRP Reference Signal Received Power

RSRQ Reference Signal Received Quality

RSS Resynchronisation signal

RSSI Received Signal Strength Indicator

SAE System Architecture Evolution

SAP Service Access Point

SBAS Satellite Based Augmentation System

SC Sidelink Control

SCell Secondary Cell

SCG Secondary Cell Group

SC-MRB Single Cell MRB

SC-RNTI Single Cell RNTI

SD-RSRP Sidelink Discovery Reference Signal Received Power

SFN System Frame Number

SI System Information

SIB System Information Block

SI-RNTI System Information RNTI

SL Sidelink

SLSS Sidelink Synchronisation Signal

SMC Security Mode Control

SMTC SS/PBCH Block Measurement Timing Configuration

SPDCCH Short PDCCH

SPS Semi-Persistent Scheduling

SPT Short Processing Time

SPUCCH Short PUCCH

SR Scheduling Request

SRB Signalling Radio Bearer

S-RSRP Sidelink Reference Signal Received Power

SSAC Service Specific Access Control

SSTD SFN and Subframe Timing Difference

STAG Secondary Timing Advance Group

S-TMSI SAE Temporary Mobile Station Identifier

STTI Short TTI

TA Tracking Area

TAG Timing Advance Group

TDD Time Division Duplex

TDM Time Division Multiplexing

TM Transparent Mode

TLE Two-Line Element

TN Terrestrial Network

TPC-RNTI Transmit Power Control RNTI

T-RPT Time Resource Pattern of Transmission

TTI Transmission Time Interval

TTT Time To Trigger

UDC Uplink Data Compression

UE User Equipment

UICC Universal Integrated Circuit Card

UL Uplink

UL-SCH Uplink Shared Channel

UM Unacknowledged Mode

UP User Plane

UP-EDT User Plane EDT

UTC Coordinated Universal Time

UTRAN Universal Terrestrial Radio Access Network

V2X Vehicle-to-Everything

VoLTE Voice over Long Term Evolution

WLAN Wireless Local Area Network

WT WLAN Termination

WUS Wake-up Signal

In the ASN.1, lower case may be used for some (parts) of the above abbreviations e.g. c-RNTI.

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| Next change |

5.2.1.1 General

System information is divided into the *MasterInformationBlock* (MIB) and a number of *SystemInformationBlocks* (SIBs) and *SystemInformationBlockPos* (posSIBs). The MIB includes a limited number of most essential and most frequently transmitted parameters that are needed to acquire other information from the cell, and is transmitted on BCH. SIBs other than *SystemInformationBlockType1* and posSIBs are carried in *SystemInformation* (SI) messages. The mapping of SIBs and posSIBs to SI messages is flexibly configurable by *schedulingInfoList* and *posSchedulingInfoList*, respectively, included in *SystemInformationBlockType1*, with restrictions that: each SIB is contained only in a single SI message and each SIB and posSIB is contained at most once in that SI message; only SIBs and posSIBs having the same scheduling requirement (periodicity) can be mapped to the same SI message; *SystemInformationBlockType2* is always mapped to the SI message that corresponds to the first entry in the list of SI messages in *schedulingInfoList*. There may be multiple SI messages transmitted with the same periodicity. *SystemInformationBlockType1* and all SI messages are transmitted on DL-SCH.

The Bandwidth reduced Low Complexity (BL) UEs and UEs in Coverage Enhancement (CE) apply Bandwidth Reduced (BR) version of the SIB, posSIB or SI messages. A UE considers itself in enhanced coverage as specified in TS 36.304 [4]. In this and subsequent clauses, anything applicable for a particular SIB, posSIB or SI message equally applies to the corresponding BR version unless explicitly stated otherwise.

For NB-IoT, a reduced set of system information block with similar functionality but different content is defined; the UE applies the NB-IoT (NB) version of the MIB and the SIBs. These are denoted *MasterInformationBlock-NB, MasterInformationBlock-TDD-NB* *and SystemInformationBlockTypeX-NB* in this specification. All other system information blocks (without NB suffix) are not applicable to NB-IoT; this is not further stated in the corresponding text.

NOTE 1: The physical layer imposes a limit to the maximum size a SIB can take. When DCI format 1C is used the maximum allowed by the physical layer is 1736 bits (217 bytes) while for format 1A the limit is 2216 bits (277 bytes), see TS 36.212 [22] and TS 36.213 [23]. For BL UEs and UEs in CE, the maximum SIB and SI message size is 936 bits, see TS 36.213 [23]. For NB-IoT, the maximum SIB and SI message size is 680 bits, see TS 36.213 [23].

In addition to broadcasting, E-UTRAN may provide *SystemInformationBlockType1,* *SystemInformationBlockType2* and/or *SystemInformationBlockType31*, including the same parameter values, via dedicated signalling i.e., within an *RRCConnectionReconfiguration* message.

The UE applies the system information acquisition and change monitoring procedures for the PCell, except when being a BL UE or a UE in CE or a NB-IoT UE in RRC\_CONNECTED mode while T311 is not running. For an SCell, E-UTRAN provides, via dedicated signalling, all system information relevant for operation in RRC\_CONNECTED when adding the SCell. However, a UE that is configured with DC shall aquire the *MasterInformationBlock* of the PSCell but use it only to determine the SFN timing of the SCG, which may be different from the MCG. Upon change of the relevant system information of a configured SCell, E-UTRAN releases and subsequently adds the concerned SCell, which may be done with a single *RRCConnectionReconfiguration* message. If the UE is receiving or interested to receive an MBMS service in a cell, the UE shall apply the system information acquisition and change monitoring procedure to acquire parameters relevant for MBMS operation and apply the parameters acquired from system information only for MBMS operation for this cell.

NOTE 2: E-UTRAN may configure via dedicated signalling different parameter values than the ones broadcast in the concerned SCell.

In MBMS-dedicated cell, non-MBSFN subframes are used for providing *MasterInformationBlock-MBMS* (MIB-MBMS) and *SystemInformationBlockType1-MBMS*. SIBs other than *SystemInformationBlockType1-MBMS* are carried in *SystemInformation-MBMS* message which is also provided on non-MBSFN subframes.

An RN configured with an RN subframe configuration does not need to apply the system information acquisition and change monitoring procedures. Upon change of any system information relevant to an RN, E-UTRAN provides the system information blocks containing the relevant system information to an RN configured with an RN subframe configuration via dedicated signalling using the *RNReconfiguration* message. For RNs configured with an RN subframe configuration, the system information contained in this dedicated signalling replaces any corresponding stored system information and takes precedence over any corresponding system information acquired through the system information acquisition procedure. The dedicated system information remains valid until overridden.

NOTE 3: E-UTRAN may configure an RN, via dedicated signalling, with different parameter values than the ones broadcast in the concerned cell.

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5.2.1.3 System information validity and notification of changes

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

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

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

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

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

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**Figure 5.2.1.3-1: Change of system Information**

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

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

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

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

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

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

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

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

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

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

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

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

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| Next 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), *SystemInformationBlockType29* (only for BL UE or the UE in CE depending on support of resource reservation), *SystemInformationBlockType21*, *SystemInformationBlockType26* (if UE is capable of V2X sidelink communication and is configured by upper layers to receive or transmit V2X sidelink communication),and *SystemInformationBlockType28* (if UE is capable of NR sidelink communication and is configured by upper layers to receive or transmit NR sidelink communication);

3> if initiating a RRC connection establishment/resume procedure; and

3> the UE is NTN capable:

4> *SystemInformationBlockType31* (*SystemInformationBlockType31-NB* in NB-IoT),if scheduled;

2> if in RRC\_INACTIVE:

3> the *MasterInformationBlock* and *SystemInformationBlockType1* as well as *SystemInformationBlockType2* through *SystemInformationBlockType8* (depending on support of the concerned RATs), *SystemInformationBlockType24* (depending on support of the concerned RATs), *SystemInformationBlockType25*, *SystemInformationBlockType29* (only for BL UE or the UE in CE depending on support of resource reservation), *SystemInformationBlockType21*, *SystemInformationBlockType26* (if UE is capable of V2X sidelink communication and is configured by upper layers to receive or transmit V2X sidelink communication),and *SystemInformationBlockType28* (if UE is capable of NR sidelink communication and is configured by upper layers to receive or transmit NR sidelink communication);

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), *SystemInformationBlockType25* (only for BL UE or the UE in CE depending on support of E-UTRA/5GC), *SystemInformationBlockType29* (only for BL UE or the UE in CE depending on support of resource reservation), *SystemInformationBlockType31* (*SystemInformationBlockType31-NB* in NB-IoT) (only for NTN capable UE) if scheduled, and for NB-IoT *SystemInformationBlockType22-NB*;

2> if in RRC\_CONNECTED and T317 is not running; and

2> the UE is NTN capable:

3> *SystemInformationBlockType31* (*SystemInformationBlockType31-NB* in NB-IoT), if scheduled;

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, systemInformationBlockType14* (*systemInformationBlockType14-NB* in NB-IoT), *systemInformationBlockType25* and *systemInformationBlockType31* (*systemInformationBlockType31-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;

#### 5.2.2.4 System information acquisition by the UE

The UE shall:

1> apply the specified BCCH configuration defined in 9.1.1.1 or BR-BCCH configuration defined in 9.1.1.8;

1> if the procedure is triggered by a system information change notification:

2> if the UE uses an idle DRX cycle longer than the modification period:

3> start acquiring the required system information, as defined in 5.2.2.3, from the next eDRX acquisition period boundary;

2> else

3> start acquiring the required system information, as defined in 5.2.2.3, from the beginning of the modification period following the one in which the change notification was received;

NOTE 1: The UE continues using the previously received system information until the new system information has been acquired.

1> if the UE is in RRC\_IDLE and enters a cell for which the UE does not have stored a valid version of the system information required in RRC\_IDLE, as defined in 5.2.2.3:

2> acquire, using the system information acquisition procedure as defined in 5.2.3, the system information required in RRC\_IDLE, as defined in 5.2.2.3;

1> following successful handover completion to a PCell for which the UE does not have stored a valid version of the system information required in RRC\_CONNECTED, as defined in 5.2.2.3:

2> acquire, using the system information acquisition procedure as defined in 5.2.3, the system information required in RRC\_CONNECTED, as defined in 5.2.2.3;

2> upon acquiring the concerned system information:

3> discard the corresponding radio resource configuration information included in the *radioResourceConfigCommon* previously received in a dedicated message, if any;

1> following a request from CDMA2000 upper layers:

2> acquire *SystemInformationBlockType8*, as defined in 5.2.3;

1> neither initiate the RRC connection establishment/resume procedure nor initiate transmission of the *RRCConnectionReestablishmentRequest* message until the UE has a valid version of the *MasterInformationBlock* (*MasterInformationBlock-NB/ MasterInformationBlock-TDD-NB* in NB-IoT) and *SystemInformationBlockType1* (*SystemInformationBlockType1-NB* in NB-IoT) messages as well as *SystemInformationBlockType2* (*SystemInformationBlockType2-NB* in NB-IoT), and for NB-IoT, *SystemInformationBlockType22-NB*;

1> not initiate the RRC connection establishment/resume procedure subject to EAB until the UE has a valid version of *SystemInformationBlockType14*, if broadcast;

1> if the UE is ETWS capable:

2> upon entering a cell during RRC\_IDLE, following successful handover or upon connection re-establishment:

3> discard any previously buffered *warningMessageSegment*;

3> clear, if any, the current values of *messageIdentifier* and *serialNumber* for *SystemInformationBlockType11*;

2> when the UE acquires *SystemInformationBlockType1* following ETWS indication, upon entering a cell during RRC\_IDLE, following successful handover or upon connection re-establishment:

3> if *schedulingInfoList* indicates that *SystemInformationBlockType10* is present:

4> if the UE is in CE:

5> start acquiring *SystemInformationBlockType10*;

4> else

5> start acquiring *SystemInformationBlockType10* immediately;

3> if *schedulingInfoList* indicates that *SystemInformationBlockType11* is present:

4> start acquiring *SystemInformationBlockType11* immediately;

NOTE 2: UEs shall start acquiring *SystemInformationBlockType10* and *SystemInformationBlockType11* as described above even when *systemInfoValueTag* in *SystemInformationBlockType1* has not changed.

1> if the UE is CMAS capable:

2> upon entering a cell during RRC\_IDLE, following successful handover or upon connection re-establishment:

3> discard any previously buffered *warningMessageSegment*;

3> clear, if any, stored values of *messageIdentifier* and *serialNumber* for *SystemInformationBlockType12* associated with the discarded *warningMessageSegment*;

2> when the UE acquires *SystemInformationBlockType1* following CMAS indication, upon entering a cell during RRC\_IDLE, following successful handover and upon connection re-establishment:

3> if *schedulingInfoList* indicates that *SystemInformationBlockType12* is present:

4> acquire *SystemInformationBlockType12*;

NOTE 3: UEs shall start acquiring *SystemInformationBlockType12* as described above even when *systemInfoValueTag* in *SystemInformationBlockType1* has not changed.

1> if the UE is interested to receive MBMS services:

2> if the UE is capable of MBMS reception as specified in 5.8:

3> if *schedulingInfoList* indicates that *SystemInformationBlockType13* is present and the UE does not have stored a valid version of this system information block:

4> acquire *SystemInformationBlockType13*;

3> else if *SystemInformationBlockType13* is present in *SystemInformationBlockType1-MBMS* and the UE does not have stored a valid version of this system information block:

4> acquire *SystemInformationBlockType13* from *SystemInformationBlockType1-MBMS*;

2> if the UE is capable of SC-PTM reception as specified in 5.8a:

3> if *schedulingInfoList* indicates that *SystemInformationBlockType20* (*SystemInformationBlockType20-NB* in NB-IoT) is present and the UE does not have stored a valid version of this system information block:

4> acquire *SystemInformationBlockType20* (*SystemInformationBlockType20-NB* in NB-IoT);

2> if the UE is capable of MBMS Service Continuity:

3> if *schedulingInfoList* indicates that *SystemInformationBlockType15* (*SystemInformationBlockType15-NB* in NB-IoT) is present and the UE does not have stored a valid version of this system information block:

4> acquire *SystemInformationBlockType15* (*SystemInformationBlockType15-NB* in NB-IoT);

1> if the UE is EAB capable:

2> when the UE does not have stored a valid version of *SystemInformationBlockType14* upon entering RRC\_IDLE, or when the UE acquires *SystemInformationBlockType1* following EAB parameters change notification, or upon entering a cell during RRC\_IDLE, or before establishing an RRC connection if using eDRX with DRX cycle longer than the modification period:

3> if *schedulingInfoList* indicates that *SystemInformationBlockType14* is present:

4> start acquiring *SystemInformationBlockType14* immediately;

3> else:

4> discard *SystemInformationBlockType14*, if previously received;

NOTE 4: EAB capable UEs start acquiring *SystemInformationBlockType14* as described above even when *systemInfoValueTag* in *SystemInformationBlockType1* has not changed.

NOTE 5: EAB capable UEs maintain an up to date *SystemInformationBlockType14* in RRC\_IDLE.

1> if the UE is capable of sidelink communication and is configured by upper layers to receive or transmit sidelink communication:

2> if the cell used for sidelink communication meets the S-criteria as defined in TS 36.304 [4]; and

2> if *schedulingInfoList* indicates that *SystemInformationBlockType18* is present and the UE does not have stored a valid version of this system information block:

3> acquire *SystemInformationBlockType18*;

1> if the UE is capable of sidelink discovery and is configured by upper layers to receive or transmit sidelink discovery announcements on the primary frequency:

2> if *schedulingInfoList* of the serving cell/ PCell indicates that *SystemInformationBlockType19* is present and the UE does not have stored a valid version of this system information block:

3> acquire *SystemInformationBlockType19*;

1> if the UE is capable of sidelink discovery and, for each of the one or more frequencies included in *discInterFreqList*, if included in *SystemInformationBlockType19* and for which the UE is configured by upper layers to receive sidelink discovery announcements on:

2> if *SystemInformationBlockType19* of the serving cell/ PCell does not provide the corresponding reception resources; and

2> if *schedulingInfoList* of the cell on the concerned frequency indicates that *SystemInformationBlockType19* is present and the UE does not have stored a valid version of this system information block:

3> acquire *SystemInformationBlockType19*;

1> if the UE is capable of sidelink discovery and, for each of the one or more frequencies included in *discInterFreqList*, if included in *SystemInformationBlockType19* and for which the UE is configured by upper layers to transmit sidelink discovery announcements on:

2> if *SystemInformationBlockType19* of the serving cell/ PCell includes *discTxResourcesInterFreq* which is set to *acquireSI-FromCarrier*; and

2> if *schedulingInfoList* of the cell on the concerned frequency indicates that *SystemInformationBlockType19* is present and the UE does not have stored a valid version of this system information block:

3> acquire *SystemInformationBlockType19*;

1> if the UE is a NB-IoT UE connected to EPC and if *ab-Enabled* included in *MasterInformationBlock-NB/ MasterInformationBlock-TDD-NB* is set to *TRUE*:

2> not initiate the RRC connection establishment/resume procedure for all access causes except mobile terminating calls until the UE has acquired the *SystemInformationBlockType14*-*NB*;

1> if the UE is capable of V2X sidelink communication and is configured by upper layers to receive or transmit V2X sidelink communication on a frequency:

2> if *schedulingInfoList* on the serving cell/PCell indicates that *SystemInformationBlockType21* is present and the UE does not have stored valid version of this system information block:

3> acquire *SystemInformationBlockType21* from serving cell/PCell;

2> if *schedulingInfoList* on the serving cell/PCell indicates that *SystemInformationBlockType26* is present and the UE does not have stored valid version of this system information block;

3> acquire *SystemInformationBlockType26* from serving cell/PCell;

1> if the UE is capable of V2X sidelink communication and is configured by upper layers to receive V2X sidelink communication on a frequency, which is not primary frequency:

2> if neither *SystemInformationBlockType21* nor *SystemInformationBlockType26* of the serving cell/ PCell provide reception resource pool for V2X sidelink communication for the concerned frequency; and

2> if the cell used for V2X sidelink communication on the concerned frequency meets the S-criteria as defined in TS 36.304 [4]:

3> if *schedulingInfoList* on the concerned frequency indicates that *SystemInformationBlockType21* is present and the UE does not have stored a valid version of this system information block:

4> acquire *SystemInformationBlockType21* from the concerned frequency;

3> if *schedulingInfoList* on the concerned frequency indicates that *SystemInformationBlockType26* is present and the UE does not have stored a valid version of this system information block:

4> acquire *SystemInformationBlockType26* from the concerned frequency;

1> if the UE is capable of V2X sidelink communication and is configured by upper layers to transmit V2X sidelink communication on a frequency, which is not primary frequency and is not included in *v2x-InterFreqInfoList* in *SystemInformationBlockType21* nor *SystemInformationBlockType26* of the serving cell/PCell:

2> if the cell used for V2X sidelink communication on the concerned frequency meets the S-criteria as defined in TS 36.304 [4]:

3> if *schedulingInfoList* on the concerned frequency indicates that *SystemInformationBlockType21* is present and the UE does not have stored a valid version of this system information block:

4> acquire *SystemInformationBlockType21* from the concerned frequency;

3> if *schedulingInfoList* on the concerned frequency indicates that *SystemInformationBlockType26* is present and the UE does not have stored a valid version of this system information block:

4> acquire *SystemInformationBlockType26* from the concerned frequency;

1> if the NB-IoT UE supports NPRACH resources using preamble format 2:

2> if *schedulingInfoList* indicates that *SystemInformationBlockType23-NB* is present and the UE does not have stored a valid version of this system information block:

3> acquire *SystemInformationBlockType23-NB*;

1> following a request from positioning upper layers:

2> acquire *SystemInformationBlockPos*, as defined in 5.2.3;

1> if the UE is capable of NR sidelink communication and is configured by upper layers to receive or transmit NR sidelink communication on a frequency:

2> if *schedulingInfoList* on the serving cell/PCell indicates that *SystemInformationBlockType28* is present and the UE does not have stored valid version of this system information block:

3> acquire *SystemInformationBlockType28* from serving cell/PCell;

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

2> when the UE does not have stored a valid version of *SystemInformationBlockType25* upon entering RRC\_IDLE, or when the UE acquires *SystemInformationBlockType1-BR* following UAC parameters change notification, or upon entering a cell during RRC\_IDLE, or before establishing, resuming or re-establishing an RRC connection if using an eDRX cycle longer than the modification period:

3> if *schedulingInfoList* indicates that *SystemInformationBlockType25* is present:

4> start acquiring *SystemInformationBlockType25* immediately before establishing, resuming or re-establishing an RRC connection;

3> else:

4> discard *SystemInformationBlockType25*, if previously received;

NOTE 5a: When connected to 5GC, BL UEs or a UEs in CE start acquiring *SystemInformationBlockType25* as described above even when *systemInfoValueTag* in *SystemInformationBlockType1-BR* has not changed.

NOTE 5b: When connected to 5GC, BL UEs or a UEs in CE maintain an up to date *SystemInformationBlockType25* in RRC\_IDLE.

1> if the UE is a NB-IoT UE connected to 5GC and if *ab-Enabled5GC* included in *MasterInformationBlock-NB/ MasterInformationBlock-TDD-NB* is set to *TRUE*:

2> not initiate the RRC connection establishment/ resume/ re-establishment procedure for all access causes until the UE has acquired the *SystemInformationBlockType14*-*NB*;

1> if the UE is NTN capable:

2> if *schedulingInfoList* indicates that *SystemInformationBlockType31* (*SystemInformationBlockType31-NB* in NB-IoT) is present:

3> immediately before establishing, resuming or re-establishing an RRC connection; or

3> if in RRC\_CONNECTED and T317 is not running:

4> acquire *SystemInformationBlockType31* (*SystemInformationBlockType31-NB* in NB-IoT);

2> if the UE supports discontinuous coverage; and

2> if *schedulingInfoList* indicates that *SystemInformationBlockType32* (*SystemInformationBlockType32-NB* in NB-IoT) is present and the UE does not have a valid version of this system information block:

3> acquire *SystemInformationBlockType32* (*SystemInformationBlockType32-NB* in NB-IoT);

The UE may apply the received SIBs or posSIBs immediately, i.e. the UE does not need to delay using a SIB or posSIB until all SI messages have been received. The UE may delay applying the received SIBs until completing lower layer procedures associated with a received or a UE originated RRC message, e.g. an ongoing random access procedure.

NOTE 6: While attempting to acquire a particular SIB/posSIB, if the UE detects from *schedulingInfoList*/ *posSchedulingInfoList* that it is no longer present, the UE should stop trying to acquire the particular SIB/ posSIB.

#### 5.2.2.5 Essential system information missing

The UE shall:

1> if in RRC\_IDLE, RRC\_INACTIVE or in RRC\_CONNECTED while T311 is running:

2> if the UE is unable to acquire the *MasterInformationBlock (MasterInformationBlock-NB/ MasterInformationBlock-TDD-NB* in NB-IoT); or

2> if the UE is neither a BL UE nor in CE nor in NB-IoT and the UE is unable to acquire the *SystemInformationBlockType1*; or

2> if the BL UE or UE in CE is unable to acquire *SystemInformationBlockType1-BR* or *SystemInformationBlockType1-BR* is not scheduled; or

2> if the NB-IoT UE is unable to acquire the *SystemInformationBlockType1-NB*:

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

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

2> else:

3> if the UE is unable to acquire the *SystemInformationBlockType2* (or *SystemInformationBlockType2-NB* in NB-IoT) and for NB-IoT, *SystemInformationBlockType22-NB* if scheduled; or

3> if *SystemInformationBlockType25* is broadcast and if the UE is connected to 5GC and is unable to acquire the *SystemInformationBlockType25*; or

3> if the UE is NTN capable, *SystemInformationBlockType31* (*SystemInformationBlockType31-NB* in NB-IoT) is broadcast and if the UE is unable to acquire the *SystemInformationBlockType31* (*SystemInformationBlockType31-NB* in NB-IoT):

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

|  |
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| Next change |

#### 5.3.3.1d Condition for establishing RRC Connection in NTN

If s*ystemInformationBlockType31* (*systemInformationBlockType31-NB* in NB-IoT) is broadcast, a RRC connection is initiated only if the UE has a valid GNSS position.

NOTE: The UE may need to re-acquire the GNSS position before establishing the connection to avoid interruption during the connection.

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| Next change |

#### 5.3.3.2 Initiation

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

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

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

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

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

1> else

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

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

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

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

1> else:

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

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

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

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

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

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

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

2> else:

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

2> stop timer T308, if running;

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

2> if access to the cell is barred:

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

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

2> if timer T302 is running:

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

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

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

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

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

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

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

6> consider access to the cell as barred;

4> else:

5> consider access to the cell as barred;

2> if access to the cell is barred:

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

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

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

2> if access to the cell is barred:

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

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

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

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

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

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

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

2> if access to the cell is barred:

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

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

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

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

3> if access to the cell is barred:

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

2> else:

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

3> if access to the cell is barred:

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

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

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

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

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

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

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

3> consider access to the cell as not barred;

2> else:

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

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

4> if access to the cell is barred:

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

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

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

4> if access to the cell is barred:

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

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

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

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

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

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

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

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

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

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

2> select '0' as the Access Category;

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

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

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

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

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

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

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

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

2> if an emergency service is ongoing:

3> select '2' as the Access Category;

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

2> else:

3> select '8' as the Access Category;

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

3> if the access attempt is barred:

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

4> the procedure ends;

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

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

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

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

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

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

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

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

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

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

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

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

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

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

2> release *obtainLocationConfig*, if configured;

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

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

2> release *measUncomBarPre*, if configured;

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

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

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

2> release *measSubframePatternPCell*, if configured;

2> if the UE was configured with DC:

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

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

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

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

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

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

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

2> release *uplinkDataCompression*, if configured;

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

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

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

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

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

3> release *pur-Config*;

3> discard previously stored *pur-Config*;

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

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

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

1> apply the CCCH configuration as specified in 9.1.1.2;

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

1> if UE supports time advance reporting and *ta-Report* is included in *SystemInformationBlockType2*:

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

1> start timer T300;

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

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

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

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

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

1> else:

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

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

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

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

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

2> else:

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

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

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

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

1> if theUEis connected to EPC:

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

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

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

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

3> perform access barring check as specified in 5.3.3.14;

3> if access to the cell is barred:

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

1> if the UE is connected to 5GC:

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

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

3> if access to the cell is barred:

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

3> else:

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

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

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

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

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

3> release *pur-Config*;

3> discard previously stored *pur-Config*;

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

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

1> apply the CCCH configuration as specified in 9.1.1.2;

1> if UE supports time advance reporting and *ta-Report* is included in *SystemInformationBlockType2-NB*:

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

1> start timer T300;

1> if the UE is establishing an RRC connection:

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

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

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

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

2> else:

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

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

2> release *schedulingRequestConfig*, if configured;

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

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

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

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

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| Next change |

#### 5.3.3.21 UE actions upon indication of out-of-date GNSS position

Upon indication that the GNSS position has become out-of-date while in RRC\_CONNECTED, the UE shall:

1> perform the actions upon leaving RRC\_CONNECTED as specified in 5.3.12, with release cause 'other'.

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| 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 when the UE connected to 5GC is a BL UE or UE in CE, 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> if the UE connected to 5GC is a BL UE or UE in CE, and 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> if the UE connected to 5GC is a BL UE or UE in CE, and 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 *RRCEarlyDataRequest* or *RRCConnectionResumeRequest* for transmission using PUR:

2> instruct the associated MAC entity to start *timeAlignmentTimer*;

1> perform the radio resource configuration procedure in accordance with the received *radioResourceConfigDedicated* and as specified in 5.3.10.0;

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

1> if stored, discard the *altFreqPriorities* provided by the *RRCConnectionRelease*;

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> if timer T331 is running:

2> stop timer T331;

2> perform the actions as specified in 5.6.20.3;

1> stop timer T323, 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> except for NB-IoT:

2> if the UE supports RLF report for inter-RAT MRO EUTRA as defined in TS 38.306 [87], and if the UE has radio link failure or handover failure information available in *VarRLF-Report* of TS 38.331 [82] and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report* of TS 38.331 [82]:

3> if *reconnectCellId* in *VarRLF-Report* of TS 38.331 [82] is not set, and if the received *RRCConnectionSetup* is in response to an *RRCConnectionRequest*:

4> set *timeUntilReconnection* in *VarRLF-Report* of TS 38.331 [82] to the time that elapsed since the last radio link failure or handover failure;

4> set *eutraReconnectCellId* in *reconnectCellId* in *VarRLF-Report* of TS 38.331 [82] to the global cell identity and the tracking area code of the PCell;

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

3> if *reconnectCellId* in *VarRLF-Report* is not set, and if the received *RRCConnectionSetup* is in response to an *RRCConnectionRequest*:

4> set *timeUntilReconnection* in *VarRLF-Report* to the time that elapsed since the last radio link failure or handover failure;

4> set *eutraReconnectCellId* in *reconnectCellId* in *VarRLF-Report* to the global cell identity and the tracking area code of 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 *RRCConnectionSetup* is not in response to transmission using PUR and the UE has a stored *pur-Config* including *pur-ConfigID*:

3> include the stored *pur-ConfigID*;

2> if the UE is connected to EPC:

3> except for NB-IoT:

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-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*;

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 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*:

4> include *rlf-InfoAvailable*;

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

4> include *logMeasAvailableMBSFN*;

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

4> include *logMeasAvailable*;

4> if Bluetooth measurement results are included in the logged measurements the UE has available:

5> include *logMeasAvailableBT*;

4> if WLAN measurement results are included in the logged measurements the UE has available:

5> include *logMeasAvailableWLAN*;

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

4> include *connEstFailInfoAvailable*;

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 E-UTRA idle/inactive measurement information concerning cells other than the PCell available in *VarMeasIdleReport*; or

3> if the SIB2 contains *idleModeMeasurementsNR* and the UE has NR idle/inactive measurement information 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;*

2> if the UE is connected to NTN:

3> include *gnss-validityDuration* in accordance with the remaining time of the GNSS validity duration;

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

1> for NB-IoT:

2> if the UE supports connected mode measurements and *connMeasConfig* is present in *SystemInformationBlockType3-NB*:

3> perform measurements as specified in 5.5.8.

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*;

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

3> instruct the associated MAC entity to start *timeAlignmentTimer*;

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> 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> if *restoreMCG-SCells* is included:

4> restore the MCG SCell(s) configuration, if stored;

3> else:

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

3> if *restoreSCG* is included:

4> restore *nr-SecondaryCellGroupConfig*, if stored;

3> else if the UE was configured with EN-DC:

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

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

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

- MCG physical layer configuration,

- MCG MAC configuration,

- MCG RLC configuration,

- PDCP configuration;

3> if *restoreMCG-SCells* is included:

4> restore the MCG SCell(s) configuration, if stored;

3> else:

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

3> if *restoreSCG* is included:

4> restore *nr-SecondaryCellGroupConfig*, if stored;

3> else if the UE was configured with NGEN-DC:

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

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

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 5.3.10.0;

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> if the *RRCReconfiguration* includes the *scg-State*:

3> perform SCG deactivation as specified in TS 38.331 [82], clause 5.3.5.18;

2> else:

3> perform SCG activation as specified in TS 38.331 [82], clause 5.3.5.19;

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, SRB3 (if configured), 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 *altFreqPriorities* provided by the *RRCConnectionRelease*;

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> stop timer T323, 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;

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*;

5> if Bluetooth measurement results are included in the logged measurements the UE has available:

6> include *logMeasAvailableBT*;

5> if WLAN measurement results are included in the logged measurements the UE has available:

6> 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*:

5> set the *measResultListIdle-r16* in the *RRCConnectionResumeComplete* message to the value of *measReportIdle-r15* in the *VarMeasIdleReport*;

5> set the *measResultListExtIdle* in the *RRCConnectionResumeComplete* message to the value of *measReportIdle-r16* 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> else:

4> if the SIB2 contains *idleModeMeasurements* and the UE has E-UTRA idle/inactive measurement information concerning cells other than the PCell available in *VarMeasIdleReport*; or

4> if the SIB2 contains *idleModeMeasurementsNR* and the UE has NR idle/inactive measurement information available in *VarMeasIdleReport*:

5> 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*;

2> if the UE is connected to NTN:

3> include *gnss-validityDuration* in accordance with the remaining time of the GNSS validity duration;

1> if the UE is configured to operate in EN-DC as result of this procedure, forward *upperLayerIndication* to upper layers as if the UE has received this field from SIB2, otherwise indicate to upper layers the absence of this field;

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

1> for NB-IoT:

2> if the UE supports connected mode measurements and *connMeasConfig* is present in *SystemInformationBlockType3-NB*:

3> perform measurements as specified in 5.5.8.

1> the procedure ends.

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| Next change |

#### 5.3.5.4 Reception of an *RRCConnectionReconfiguration* including the *mobilityControlInfo* by the UE (handover)

If the *RRCConnectionReconfiguration* message includes the *mobilityControlInfo* and theUE is able to comply with the configuration included in this message, the UE shall:

1> if the *RRCConnectionReconfiguration* includes the *scg-State*:

2> perform SCG deactivation as specified in TS 38.331 [82], clause 5.3.5.18;

1> else:

2> perform SCG activation as specified in TS 38.331 [82], clause 5.3.5.19;

1> if *daps-HO* is not configured for any DRB:

2> stop timer T310, if running;

2> if timer T316 is running:

3> stop timer T316;

3> clear the information included in *VarRLF-Report*, if any;

2> resume MCG transmission, if suspended;

1> stop timer T312, if running;

1> start timer T304 with the timer value set to *t304,* as included in the *mobilityControlInfo*;

1> stop timer T370, if running;

1> if the *carrierFreq* is included:

2> consider the target PCell to be one on the frequency indicated by the *carrierFreq* with a physical cell identity indicated by the *targetPhysCellId*;

1> else:

2> consider the target PCell to be one on the frequency of the source PCell with a physical cell identity indicated by the *targetPhysCellId*;

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> start synchronising to the DL of the target PCell;

NOTE 1: The UE should perform the handover as soon as possible following the reception of the RRC message triggering the handover, which could be before confirming successful reception (HARQ and ARQ) of this message.

1> if BL UE or UE in CE:

2> if *sameSFN-Indication* is not present in *mobilityControlInfo*:

3> acquire the *MasterInformationBlock* in the target PCell;

1> if *makeBeforeBreak* is configured:

2> perform the remainder of this procedure including and following resetting MAC after the UE has stopped the uplink transmission/downlink reception with the source PCell;

NOTE 1a: It is up to UE implementation when to stop the uplink transmission/ downlink reception with the source PCell to initiate re-tuning for connection to the target cell, as specified in TS 36.133 [16], if *makeBeforeBreak* is configured.

NOTE 1b: It is up to UE implementation when to stop the uplink transmission/ downlink reception with the source SCell(s) after receiving *RRCConnectionReconfiguration* message.

1> if *daps-HO* is configured for any DRB:

2> establish a MAC entity for the target PCell, with the same configuration as the MAC entity for the source PCell;

2> for each DRB configured with *daps-HO*:

3> establish the RLC entity or entities and the associated DTCH logical channel for the target PCell, with the same configurations as for the source PCell;

3> reconfigure the PDCP entity to configure DAPS as specified in TS36.323 [8].

2> for each DRB not configured with *daps-HO*:

3> re-establish PDCP;

3> re-establish the RLC entity and associate it, and the associated DTCH logical channel, to the target PCell;

2> for each SRB:

3> establish a PDCP entity for the target PCell, with the same configuration as the PDCP entity for the source PCell;

3> establish an RLC entity and an associated DCCH logical channel for the target PCell, with the same configuration as for the source PCell;

2> suspend the SRBs for the source PCell;

NOTE 1c: In order to understand if a *daps-HO* is configured, the UE needs to check the presence of the field *daps-HO* within the received *RadioResourceConfigDedicated* IE.

NOTE 1d: In DAPS handover, the UE may re-establish PDCP and RLC entity for a DRB not configured with *daps-HO* when MAC successfully completes the random access procedure. In this case, the UE suspends data transmission and reception for all DRBs not configured with *daps-HO* in the source PCell for the duration of the DAPS handover.

1> else (if *daps-HO* is not configured):

2> reset MCG MAC and SCG MAC, if configured;

2> release *uplinkDataCompression*, if configured;

2> re-establish PDCP for all RBs configured with *pdcp-config* that are established;

NOTE 2: The handling of the radio bearers after the successful completion of the PDCP re-establishment, e.g. the re-transmission of unacknowledged PDCP SDUs (as well as the associated status reporting), the handling of the SN and the HFN, is specified in TS 36.323 [8].

NOTE 2a: At handover the *reestablishPDCP* flag will be set for all RBs configured with NR PDCP in *nr-RadioBearerConfig1* or *nr-RadioBearerConfig2* TS 38.331 [82] which will cause the PDCP entity to be re-established also for these RBs.

2> re-establish MCG RLC and SCG RLC, if configured, for all RBs that are established;

1> for each SCell configured for the UE other than the PSCell:

2> if the received *RRCConnectionReconfiguration* message includes *sCellState* for the SCell and indicates *activated*:

3> configure lower layers to consider the SCell to be in activated state;

2> else if the received *RRCConnectionReconfiguration* message includes *sCellState* for the SCell and indicates *dormant*:

3> configure lower layers to consider the SCell to be in dormant state;

2> else:

3> configure lower layers to consider the SCell to be in deactivated state;

1> apply the value of the *newUE-Identity* as the C-RNTI in the target MCG;

1> if the *RRCConnectionReconfiguration* message includes the *fullConfig*:

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

1> configure lower layers in accordance with the received *radioResourceConfigCommon*;

1> if the received *RRCConnectionReconfiguration* message includes the *rach-Skip*:

2> configure lower layers to apply the *rach-Skip* for the target MCG, as specified in TS 36.213 [23] and 36.321 [6];

1> if UE supports time advance reporting and the received *radioResourceConfigCommon* includes the *ta-Report*:

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

1> configure lower layers in accordance with any additional fields, not covered in the previous, if included in the received mobilityControlInfo;

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

2> perform SCell release as specified in 5.3.10.3a;

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

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

1> if the received *RRCConnectionReconfiguration* includes the *scg-Configuration*; or

1> if the current UE configuration includes one or more split DRBs and the received *RRCConnectionReconfiguration* includes *radioResourceConfigDedicated* including *drb-ToAddModList*:

2> perform SCG reconfiguration as specified in 5.3.10.10;

1> if the *RRCConnectionReconfiguration* message includes the *radioResourceConfigDedicated*:

2> perform the radio resource configuration procedure as specified in 5.3.10.0;

1> if the *securityConfigHO* (without suffix) is included in the *RRCConnectionReconfiguration*:

2> if the *keyChangeIndicator* received in the *securityConfigHO* is set to *TRUE*:

3> update the KeNB key based on the KASME key taken into use with the latest successful NAS SMC procedure, as specified in TS 33.401 [32];

2> else:

3> update the KeNB key based on the current KeNB or the NH, using the *nextHopChainingCount* value indicated in the *securityConfigHO*, as specified in TS 33.401 [32];

NOTE 2b: If the UE needs to update the S-KeNB key as specified in 5.3.10.10, the UE updates the S-KeNB after updating the KeNB key.

2> store the *nextHopChainingCount* value;

2> if the *securityAlgorithmConfig* is included in the *securityConfigHO*:

3> derive the KRRCint key associated with the *integrityProtAlgorithm*, as specified in TS 33.401 [32];

3> if connected as an RN; or

3> if capable of user plane integrity protection:

4> derive the KUPint key associated with the *integrityProtAlgorithm*, as specified in TS 33.401 [32];

3> derive the KRRCenc key and the KUPenc key associated with the *cipheringAlgorithm*, as specified in TS 33.401 [32];

2> else:

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

3> if connected as an RN; or

3> if capable of user plane integrity protection:

4> derive the KUPint key associated with the current integrity algorithm, as specified in TS 33.401 [32];

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

2> configure lower layers to apply the integrity protection algorithm and the KRRCint key, i.e. the integrity protection configuration shall be applied to all subsequent messages received and sent by the UE, including the message used to indicate the successful completion of the procedure;

2> configure lower layers 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, including the message used to indicate the successful completion of the procedure;

NOTE 2c: For a DRB configured for DAPS HO, the new ciphering algorithm and the KUPenc key is applied for traffic exchange between the UE and the target MCG while the old ciphering algorithm and KUPenc key is applied for traffic exchange between the UE and the source MCG.

1> else if the *securityConfigHO-v1530* is included in the *RRCConnectionReconfiguration*:

2> if the *nas-Container* is received:

3> forward the *nas-Container* to upper layers;

2> if the *keyChangeIndicator-r15* is received and is set to *TRUE*:

3> update the KeNB key based on the KAMF key, as specified in TS 33.501 [86];

2> else:

3> update the KeNB key based on the current KeNB or the NH, using the received *nextHopChainingCount-r15*, as specified in TS 33.501 [86];

2> store the *nextHopChainingCount-r15* value;

2> if the security*AlgorithmConfig-r15* is received:

3> derive the KRRCint key associated with the *integrityProtAlgorithm*, as specified in TS 33.401 [32];

3> derive the KRRCenc key and the KUPenc key associated with the *cipheringAlgorithm*, as specified in TS 33.401 [32];

2> else:

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

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

1> if the received *RRCConnectionReconfiguration* includes the *nr-Config* and it is set to *release*; or

1> if the received *RRCConnectionReconfiguration* includes *endc-ReleaseAndAdd* and it is set to *TRUE*:

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

1> if the received *RRCConnectionReconfiguration* includes the *sk-Counter*:

2> perform key update procedure as specified in in TS 38.331 [82], clause 5.3.5.7;

1> if the received *RRCConnectionReconfiguration* 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 *RRCConnectionReconfiguration* 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 *RRCConnectionReconfiguration* includes the *nr-RadioBearerConfig2*:

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

1> if connected as an RN:

2> configure lower layers to apply the integrity protection algorithm and the KUPint key, for current or subsequently established DRBs that are configured to apply integrity protection, if any;

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

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

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

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

1> if the received *RRCConnectionReconfiguration* includes the *systemInformationBlockType1Dedicated*:

2> perfom the actions upon reception of the *SystemInformationBlockType1* message as specified in 5.2.2.7;

1> perform the measurement related actions as specified in 5.5.6.1;

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

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

1> perform the measurement identity autonomous removal as specified in 5.5.2.2a;

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

1> if the *RRCConnectionReconfiguration* message includes the *otherConfig*:

2> perform the other configuration procedure as specified in 5.3.10.9;

1> if the *RRCConnectionReconfiguration* message includes the *sl-DiscConfig* or *sl-CommConfig*:

2> perform the sidelink dedicated configuration procedure as specified in 5.3.10.15;

1> if the *RRCConnectionReconfiguration* message includes *wlan-OffloadInfo*:

2> perform the dedicated WLAN offload configuration procedure as specified in 5.6.12.2;

1> if *handoverWithoutWT-Change* is not configured:

2> 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> if the *RRCConnectionReconfiguration* message includes *rclwi-Configuration*:

2> perform the WLAN traffic steering command procedure as specified in 5.6.16.2;

1> if the *RRCConnectionReconfiguration* message includes *lwa-Configuration*:

2> perform the LWA configuration procedure as specified in 5.6.14.2;

1> if the *RRCConnectionReconfiguration* message includes *lwip-Configuration*:

2> perform the LWIP reconfiguration procedure as specified in 5.6.17.2;

1> if the *RRCConnectionReconfiguration* message includes the *sl-V2X-ConfigDedicated* or *mobilityControlInfoV2X*:

2> perform the V2X sidelink communication dedicated configuration procedure as specified in 5.3.10.15a;

NOTE 2d: In case of conditional reconfiguration the text "if the received *RRCConnectionReconfiguration. . .*" corresponds to applying the stored *RRCConnectionReconfiguration* message (according to 5.3.5.9.5).

1> if the UE is configured to operate in EN-DC as result of this procedure, forward *upperLayerIndication*, as if the UE receives this field from SIB2, to upper layers, otherwise indicate upper layers absence of this field;

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

2> 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*:

3> include *rlf-InfoAvailable*;

2> if the UE has MBSFN logged measurements available for E-UTRA and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport* and if T330 is not running:

3> include *logMeasAvailableMBSFN*;

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

3> include the *logMeasAvailable*;

3> if Bluetooth measurement results are included in the logged measurements the UE has available:

4> include *logMeasAvailableBT*;

3> if WLAN measurement results are included in the logged measurements the UE has available:

4> include *logMeasAvailableWLAN*;

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

3> include *connEstFailInfoAvailable*;

2> if the *RRCConnectionReconfiguration* message includes *perCC-GapIndicationRequest*:

3> include *perCC-GapIndicationList* and *numFreqEffective*;

2> if the frequencies are configured for reduced measurement performance:

3> include *numFreqEffectiveReduced*;

2> if the UE has flight path information available:

3> include *flightPathInfoAvailable*;

2> if the received *RRCConnectionReconfiguration* message included *nr-SecondaryCellGroupConfig*:

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

2> if the UE is connected to NTN:

3> include *gnss-validityDuration* in accordance with the remaining time of the GNSS validity duration;

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

1> if MAC successfully completes the random access procedure; or

1> if MAC indicates the successful reception of a PDCCH transmission addressed to C-RNTI and if *rach-Skip* is configured:

2> stop timer T304;

2> if *daps-HO* is configured for any DRB:

3> stop timer T310 for the source PCell, if running;

3> for each DAPS bearer trigger UL data switching, as specified in TS 36.323 [8];

2> release *rach-Skip*;

2> apply the parts of the CQI reporting configuration, the scheduling request configuration and the sounding RS configuration that do not require the UE to know the SFN of the target PCell, if any;

2> apply the parts of the measurement and the radio resource configuration that require the UE to know the SFN of the target PCell (e.g. measurement gaps, periodic CQI reporting, scheduling request configuration, sounding RS configuration), if any, upon acquiring the SFN of the target PCell;

NOTE 3: Whenever the UE shall setup or reconfigure a configuration in accordance with a field that is received it applies the new configuration, except for the cases addressed by the above statements.

2> if the UE is configured to provide IDC indications:

3> if the UE has initiated the transmission of an *InDeviceCoexIndication* message during the last 1 second preceding reception of the *RRCConnectionReconfiguration* message including *mobilityControlInfo*; or

3> if the *RRCConnectionReconfiguration* message is applied due to a conditional reconfiguration execution and the UE has initiated transmission of an *InDeviceCoexIndication* message since it was configured to do so in accordance with 5.6.9.2:

4> initiate transmission of the *InDeviceCoexIndication* message in accordance with 5.6.9.3;

2> if the UE is configured to provide power preference indications, overheating assistance information, SPS assistance information, delay budget report or maximum bandwidth preference indications:

3> if the UE has initiated the transmission of a *UEAssistanceInformation* message during the last 1 second preceding reception of the *RRCConnectionReconfiguration* message including *mobilityControlInfo*; or

3> if the *RRCConnectionReconfiguration* message is applied due to a conditional reconfiguration execution, and the UE has initiated transmission of a *UEAssistanceInformation* message for the corresponding cell group since it was configured to do so in accordance with 5.6.10.2:

4> initiate transmission of the *UEAssistanceInformation* message in accordance with 5.6.10.3;

2> if *SystemInformationBlockType15* is broadcast by the PCell:

3> if the UE has initiated the transmission of a *MBMSInterestIndication* message during the last 1 second preceding reception of the *RRCConnectionReconfiguration* message including *mobilityControlInfo*; or

3> if the *RRCConnectionReconfiguration* message is applied due to a conditional reconfiguration execution and the UE supports MBMS reception and the UE has initiated transmission of an *MBMSInterestIndication* message since it was configured to do so in accordance with 5.8.5.2:

4> ensure having a valid version of *SystemInformationBlockType15* for the PCell;

4> determine the set of MBMS frequencies of interest in accordance with 5.8.5.3;

4> determine the set of MBMS services of interest in accordance with 5.8.5.3a;

4> initiate transmission of the *MBMSInterestIndication* message in accordance with 5.8.5.4;

2> if *SystemInformationBlockType18* is broadcast by the target PCell; and the UE initiated the transmission of a *SidelinkUEInformation* message indicating a change of sidelink communication related parameters relevant in target PCell (i.e. change of *commRxInterestedFreq* or *commTxResourceReq*, *commTxResourceReqUC* if *SystemInformationBlockType18* includes *commTxResourceUC-ReqAllowed* or *commTxResourceInfoReqRelay* if PCell broadcasts *SystemInformationBlockType19* including *discConfigRelay*) during the last 1 second preceding reception of the *RRCConnectionReconfiguration* message including *mobilityControlInfo*; or

2> if *SystemInformationBlockType19* is broadcast by the target PCell; and the UE initiated the transmission of a *SidelinkUEInformation* message indicating a change of sidelink discovery related parameters relevant in target PCell (i.e. change of *discRxInterest* or *discTxResourceReq*, *discTxResourceReqPS* if *SystemInformationBlockType19* includes *discConfigPS* or *discRxGapReq* or *discTxGapReq* if the UE is configured with *gapRequestsAllowedDedicated* set to *true* or if the UE is not configured with *gapRequestsAllowedDedicated* and *SystemInformationBlockType19* includes *gapRequestsAllowedCommon*) during the last 1 second preceding reception of the *RRCConnectionReconfiguration* message including *mobilityControlInfo*; or

2> if *SystemInformationBlockType21* is broadcast by the target PCell; and the UE initiated the transmission of a *SidelinkUEInformation* message indicating a change of V2X sidelink communication related parameters relevant in target PCell (i.e. change of *v2x-CommRxInterestedFreqList* or *v2x-CommTxResourceReq*) during the last 1 second preceding reception of the *RRCConnectionReconfiguration* message including *mobilityControlInfo*; or

2> if the *RRCConnectionReconfiguration* message is applied due to a conditional reconfiguration execution, and at least one of *SystemInformationBlockType18*, *SystemInformationBlockType19*, and *SystemInformationBlockType21* is broadcast by the target PCell, and the UE has initiated transmission of a *SidelinkUEInformation* message since it was configured to do so in accordance with 5.10.2.2:

3> initiate transmission of the *SidelinkUEInformation* message in accordance with 5.10.2.3;

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

2> for each *measId* of the source SpCell configuration, if the associated *reportConfig* is *condReconfigurationTriggerEUTRA*:

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

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

3> if the *measObjectId* is only included in a *MeasIdToAddMod*:

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

2> the procedure ends;

NOTE 4: The UE is not required to determine the SFN of the target PCell by acquiring system information from that cell before performing RACH access in the target PCell, except for BL UEs or UEs in CE when *sameSFN-Indication* is not present in *mobilityControlInfo*.

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5.3.7.3 Actions following cell selection while T311 is running

Upon selecting a suitable E-UTRA cell, the UE shall:

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> if the UE is connected to 5GC and the selected cell is only connected to EPC; or

1> if the UE is connected to EPC and the selected cell is only connected to 5GC:

2> perform the actions upon leaving RRC\_CONNECTED as specified in 5.3.12, with release cause 'RRC connection failure';

1> else:

2> stop timer T311;

2> if the cell selection is triggered by detecting radio link failure of the MCG or handover failure (including intra-E-UTRA handover and mobility from E-UTRA); and

2> if *attemptCondReconf* is configured; and

2> if the selected cell is one of the target candidate cells in *VarConditionalReconfiguration*:

3> apply the stored *condReconfigurationToApply* of the selected cell and perform the actions as specified in 5.3.5.4;

2> else:

3> if the UE is configured with *conditionalReconfiguration*:

4> release *uplinkDataCompression*, if configured;

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

4> reset MAC;

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

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

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

4> for the MCG, apply the default semi-persistent scheduling configuration as specified in 9.2.3;

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

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

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

4> release *obtainLocationConfig*, if configured;

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

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

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

4> release *measSubframePatternPCell*, if configured;

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

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

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

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

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

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

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

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

5> release the RN subframe configuration;

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

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

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

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

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

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

3> remove all the entries within *VarConditionalReconfiguration*, if any;

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

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

4> if the associated *measObjectId* is only associated with *condReconfigurationTriggerEUTRA/condReconfigurationTriggerNR*:

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

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

3> start timer T301;

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

3> if UE supports time advance reporting and *ta-Report* is included in *SystemInformationBlockType2 (SystemInformationBlockType2-NB* in NB-IoT):

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

3> if the UE is a NB-IoT UE connected to EPC, the UE supports RRC connection re-establishment for the Control Plane CIoT EPS optimisation and AS security has not been activated; and

3> if *cp-reestablishment* is not included in *SystemInformationBlockType2-NB*:

4> perform the actions upon leaving RRC\_CONNECTED as specified in 5.3.12, with release cause 'RRC connection failure';

3> else:

4> initiate transmission of the *RRCConnectionReestablishmentRequest* message in accordance with 5.3.7.4;

NOTE: This procedure applies also if the UE returns to the source PCell.

Upon selecting an inter-RAT cell, the UE shall:

1> if the selected cell is a UTRA cell, and if the UE supports Radio Link Failure Report for Inter-RAT MRO, include *selectedUTRA-CellId* in the *VarRLF-Report* and set it to the physical cell identity and carrier frequency of the selected UTRA cell;

1> perform the actions upon leaving RRC\_CONNECTED as specified in 5.3.12, with release cause 'RRC connection failure';

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| Next change |

#### *5.3.7.5 Reception of the RRCConnectionReestablishment 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> stop timer T301;

1> consider the current cell to be the PCell;

1> except for a NB-IoT UE for which AS security has not been activated:

2> if SRB1 was configured with NR PDCP and the UE is connected to EPC:

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

NOTE 1a: 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, re-establish the PDCP entity;

2> re-establish RLC for SRB1;

2> perform the radio resource configuration procedure in accordance with the received *radioResourceConfigDedicated* and as specified in 5.3.10.0;

2> resume SRB1;

NOTE 2: E-UTRAN should not transmit any message on SRB1 prior to receiving the *RRCConnectionReestablishmentComplete* message.

2> if UE is connected to EPC, update the KeNB key based on the KASME key to which the current KeNB is associated, using the *nextHopChainingCount* value indicated in the *RRCConnectionReestablishment* message, as specified in TS 33.401 [32];

2> else if UE is connected to 5GC, update the KeNB key based on the KAMF key to which the current KeNB is associated, using the *nextHopChainingCount* value indicated in the *RRCConnectionReestablishment* message, as specified in TS 33.501 [86];

2> store the *nextHopChainingCount* value;

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

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

2> if connected as an RN; or

2> if capable of user plane integrity protection:

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

2> configure lower layers to activate 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, including the message used to indicate the successful completion of the procedure;

2> if connected as an RN:

3> configure lower layers to apply integrity protection using the previously configured algorithm and the KUPint key, for subsequently resumed or subsequently established DRBs that are configured to apply integrity protection, if any;

2> configure lower layers to apply ciphering using the previously configured algorithm, the KRRCenc key and the KUPenc key immediately, i.e., ciphering shall be applied to all subsequent messages received and sent by the UE, including the message used to indicate the successful completion of the procedure;

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

3> set the content of *RRCConnectionReestablishmentComplete* message as follows:

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 the *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* and if T330 is not running:

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 the *logMeasAvailable*;

5> if Bluetooth measurement results are included in the logged measurements the UE has available:

6> include the *logMeasAvailableBT*;

5> if WLAN measurement results are included in the logged measurements the UE has available:

6> include the *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 the *connEstFailInfoAvailable*;

4> if the UE has flight path information available and if the UE is connected to EPC:

5> include *flightPathInfoAvailable*;

3> perform the measurement related actions as specified in 5.5.6.1;

3> perform the measurement identity autonomous removal as specified in 5.5.2.2a;

2> else:

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 2a: 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 the *rlf-InfoAvailable*;

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

5> include the *anr-InfoAvailable*;

2> if the UE is connected to NTN:

3> include *gnss-validityDuration* in accordance with the remaining time of the GNSS validity duration;

2> submit the *RRCConnectionReestablishmentComplete* message to lower layers for transmission;

2> if *SystemInformationBlockType15* is broadcast by the PCell:

3> if the UE has transmitted an *MBMSInterestIndication* message during the last 1 second preceding detection of radio link failure:

4> ensure having a valid version of *SystemInformationBlockType15* for the PCell;

4> determine the set of MBMS frequencies of interest in accordance with 5.8.5.3;

4> determine the set of MBMS services of interest in accordance with 5.8.5.3a;

4> initiate transmission of the *MBMSInterestIndication* message in accordance with 5.8.5.4;

2> if *SystemInformationBlockType18* is broadcast by the PCell; and the UE transmitted a *SidelinkUEInformation* message indicating a change of sidelink communication related parameters relevant in PCell (i.e. change of *commRxInterestedFreq* or *commTxResourceReq*, *commTxResourceReqUC* if *SystemInformationBlockType18* includes *commTxResourceUC-ReqAllowed* or *commTxResourceInfoReqRelay* if PCell broadcasts *SystemInformationBlockType19* including *discConfigRelay*) during the last 1 second preceding detection of radio link failure; or

2> if *SystemInformationBlockType19* is broadcast by the PCell; and the UE transmitted a *SidelinkUEInformation* message indicating a change of sidelink discovery related parameters relevant in PCell (i.e. change of *discRxInterest* or *discTxResourceReq*, *discTxResourceReqPS* if *SystemInformationBlockType19* includes *discConfigPS* or *discRxGapReq* or *discTxGapReq* if the UE is configured with *gapRequestsAllowedDedicated* set to *true* or if the UE is not configured with *gapRequestsAllowedDedicated* and *SystemInformationBlockType19* includes *gapRequestsAllowedCommon*) during the last 1 second preceding detection of radio link failure; or

2> if *SystemInformationBlockType21* including *sl-V2X-ConfigCommon* is broadcast by the PCell; and the UE transmitted a *SidelinkUEInformation* message indicating a change of V2X sidelink communication related parameters relevant in PCell (i.e. change of *v2x-CommRxInterestedFreqList* or *v2x-CommTxResourceReq*) during the last 1 second preceding detection of radio link failure:

3> initiate transmission of the *SidelinkUEInformation* message in accordance with 5.10.2.3;

1> for a NB-IoT UE for which AS security has not been activated:

2> validate *dl-NAS-MAC*, as specified in TS 33.401 [32];

2> if *dl-NAS-MAC* check fails:

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

2> except for a UE that only supports the Control Plane CIoT EPS/5GS optimisation:

3> re-establish PDCP for SRB1;

3> re-establish RLC for SRB1;

2> re-establish RLC for SRB1bis;

2> perform the radio resource configuration procedure in accordance with the received *radioResourceConfigDedicated* and as specified in 5.3.10.0;

2> except for a UE that only supports the Control Plane CIoT EPS/5GS optimisation:

3> resume SRB1;

2> resume SRB1bis;

NOTE 3: E-UTRAN should not transmit any message on SRB1bis prior to receiving the *RRCConnectionReestablishmentComplete* message.

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

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

NOTE 4: 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 the UE is connected to NTN:

3> include *gnss-validityDuration* in accordance with the remaining time of the GNSS validity duration;

2> submit the *RRCConnectionReestablishmentComplete* message to lower layers for transmission;

1> for NB-IoT:

2> if the UE supports connected mode measurements and *connMeasConfig* is present in *SystemInformationBlockType3-NB*:

3> perform measurements as specified in 5.5.8.

1> the procedure ends;

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| Next change |

5.3.X T317 expiry

The UE shall:

1> if in RRC\_CONNECTED:

2> inform lower layers that the UL synchronisation is lost;

2> start timer T318;

2> acquire *SystemInformationBlockType31* (*SystemInformationBlockType31-NB* in NB-IoT) as specified in 5.2.2;

2> upon successful acquisition of *SystemInformationBlockType31* (*SystemInformationBlockType31-NB* in NB-IoT):

3> stop timer T318;

3> inform lower layers that the UL synchronisation is restored;

NOTE: *SystemInformationBlockType31* (*SystemInformationBlockType31-NB* in NB-IoT) may be broadcast on a different narrowband or different NB-IoT carrier than the one configured to the UE.

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| Next change |

#### 5.5.5.1 General



Figure 5.5.5.1-1: Measurement reporting

The purpose of this procedure is to transfer measurement results from the UE to E-UTRAN. The UE shall initiate this procedure only after successful security activation.

For the *measId* for which the measurement reporting procedure was triggered, the UE shall set the *measResults* within the *MeasurementReport* message as follows:

1> set the *measId* to the measurement identity that triggered the measurement reporting;

1> set the *measResultPCell* to include the quantities of the PCell;

1> set the *measResultServFreqList* to include for each E-UTRA SCell that is configured, if any, within *measResultSCell* the quantities of the concerned SCell, if available according to performance requirements in TS 36.133 [16], except if *purpose* for the *reportConfig* associated with the *measId* that triggered the measurement reporting is set to *reportLocation*;

1> if the *reportConfig* associated with the *measId* that triggered the measurement reporting includes *reportAddNeighMeas*:

2> for each E-UTRA serving frequency for which *measObjectId* is referencedin the *measIdList*, other than the frequency corresponding with the *measId* that triggered the measurement reporting:

3> set the *measResultServFreqList* to include within *measResultBestNeighCell* the *physCellId* and the quantities of the best non-serving cell, based on RSRP, on the concerned serving frequency;

1> if the *triggerType* is set to *event*; and if the corresponding measObject concerns NR; and if *eventId* is set to *eventB1-NR* or *eventB2-NR*; or

1> if the *triggerType* is set to *event*; and if *eventId* is set to *eventA3* or *eventA4* or *eventA5*:

2> if *purpose* for the *reportConfig* or *reportConfigInterRAT* associated with the *measId* that triggered the measurement reporting is set to a value other than *reportLocation*:

3> set the *measResultServFreqListNR* to include for each NR serving frequency that the UE is configured to measure according to TS 38.331 [82], if any, the following:

4> set *measResultSCell* to include the available results of the NR serving cell, as specified in 5.5.5.2;

4> if the *reportConfig* associated with the *measId* that triggered the measurement reporting includes *reportAddNeighMeas* and if *eventId* is set to *eventA3* or *eventA4* or *eventA5*:

5> set *measResultBestNeighCell* to include the available results, as specified in 5.5.5.2, of the non-serving cell with the highest sorting quantity determined as specified in 5.5.5.3;

3> for each (serving or neighbouring) cell for which the UE reports results according to the previous, additionally include available beam results according to the following:

4> if *maxReportRS-Index* is configured, set *measResultRS-IndexList* to include available results, as specified in 5.5.5.2, of up to *maxReportRS-Index* beams, ordered based on the quantity determined as specified in 5.5.5.3;

1> if there is at least one applicable neighbouring cell to report:

2> set the *measResultNeighCells* to include the best neighbouring cells up to *maxReportCells* in accordance with the following:

3> if the *triggerType* is set to *event*:

4> include the cells included in the *cellsTriggeredList* as defined within the *VarMeasReportList* for this *measId*;

3> else:

4> include the applicable cells for which the new measurement results became available since the last periodical reporting or since the measurement was initiated or reset;

NOTE 1: The reliability of the report (i.e. the certainty it contains the strongest cells on the concerned frequency) depends on the measurement configuration i.e. the *reportInterval*. The related performance requirements are specified in TS 36.133 [16].

3> for each cell that is included in the *measResultNeighCells*, include the *physCellId*;

3> if the *triggerType* is set to *event*; or the *purpose* is set to *reportStrongestCells* or to *reportStrongestCellsForSON*:

4> for each included cell, include the layer 3 filtered measured results in accordance with the *reportConfig* for this *measId*, ordered as follows:

5> if the *measObject* associated with this *measId* concerns E-UTRA:

6> set the *measResult* to include the quantity(ies) indicated in the *reportQuantity* within the concerned *reportConfig*;

6> sort the included cells in order of decreasing *triggerQuantity*, i.e. the best cell is included first;

5> if the *measObject* associated with this *measId* concerns NR:

6> set the *measResultCell* to include the quantity(ies) indicated in the *reportQuantityCellNR* within the concerned *reportConfig*;

6> if *maxReportRS-Index* and *reportQuantityRS-IndexNR* are configured, set *measResultRS-IndexList* to include the result of the best beam if *threshRS-Index* is included in the *VarMeasConfig* for the corresponding *measObject*, and the remaining beams whose quantity is above *threshRS-Index*, up to *maxReportRS-Index* beams in total:

7> order beams based on the sorting quantity determined as specified in 5.5.5.3;

7> for each included beam:

8> include *ssbIndex*;

8> if *reportRS-IndexResultsNR* is set to TRUE, for each quantity indicated, include the corresponding measurement result in *measResultSSB-Index* for each *ssb-Index*;

6> sort the included cells in order of decreasing sorting quantity determined as specified in 5.5.5.3;

5> if the *measObject* associated with this *measId* concerns UTRA FDD and if *ReportConfigInterRAT* includes the *reportQuantityUTRA-FDD*:

6> set the *measResult* to include the quantities indicated by the *reportQuantityUTRA-FDD* in order of decreasing *measQuantityUTRA-FDD* within the *quantityConfig*, i.e. the best cell is included first;

5> if the *measObject* associated with this *measId* concerns UTRA FDD and if *ReportConfigInterRAT* does not include the *reportQuantityUTRA-FDD*; or

5> if the *measObject* associated with this *measId* concerns UTRA TDD, GERAN or CDMA2000:

6> set the *measResult* to the quantity as configured for the concerned RAT within the *quantityConfig* in order of either decreasing quantity for UTRA and GERAN or increasing quantity for CDMA2000 *pilotStrength*, i.e. the best cell is included first;

3> else if the *purpose* is set to *reportCGI* and the corresponding *measObject* concerns a RAT other than NR:

4> if the mandatory present fields of the *cgi-Info* for the cell indicated by the *cellForWhichToReportCGI* in the associated *measObject* have been obtained:

5> if the *includeMultiBandInfo* is configured:

6> include the *freqBandIndicator*;

6> if the cell broadcasts the *multiBandInfoList*, include the *multiBandInfoList*;

6> if the cell broadcasts the *freqBandIndicatorPriority*, include the *freqBandIndicatorPriority*;

5> if the cell broadcasts a CSG identity:

6> include the *csg-Identity*;

6> include the *csg-MemberStatus* and set it to *member* if the cell is a CSG member cell;

5> if the *si-RequestForHO* is configured within the *reportConfig* associated with this *measId*:

6> include the *cgi-Info* containing all the fields other than the *plmn-IdentityList* that have been successfully acquired;

6> include, within the *cgi-Info*, the field *plmn-IdentityList* in accordance with the following:

7> if the cell is a CSG member cell, determine the subset of the PLMN identities, starting from the second entry of PLMN identities in the broadcast information, that meet the following conditions:

a) equal to the RPLMN or an EPLMN; and

b) the Permitted CSG list of the UE includes an entry comprising of the concerned PLMN identity and the CSG identity broadcast by the cell;

7> if the subset of PLMN identities determined according to the previous includes at least one PLMN identity, include the *plmn-IdentityList* and set it to include this subset of the PLMN identities;

7> if the cell is a CSG member cell, include the *primaryPLMN-Suitable* if the primary PLMN meets conditions a) and b) specified above;

7> if the cell does not broadcast *csg-Identity* and the UE is capable of reporting the *plmn-IdentityList* from cells not broadcasting *csg-Identity*:

8> include in the plmn-IdentityList the list of identities starting from the second entry of PLMN identities in the broadcast information;

5> else:

6> include the *cgi-Info* containing all the fields that have been successfully acquired and in accordance with the following:

7> include in the *plmn-IdentityList* the list of identities starting from the second entry of PLMN Identities in the broadcast information;

4> if the *cellAccessRelatedInfoList-5GC* has been acquired:

5> include *cgi-Info-5GC*;

NOTE 1a: The UE may include the *cgi-Info-5GC* even when the N1 mode is disabled.

3> else if the *purpose* is set to *reportCGI* and the corresponding *measObject* concerns NR RAT:

4> if the Cell information of *cgi-Info* for the cell indicated by the *cellForWhichToReportCGI* in the associated *measObject* has been obtained:

5> include *plmn-IdentityInfoList* including *plmn-IdentityList*, *trackingAreaCode* (if available), *ran-AreaCode* (if available) and *cellIdentity* for each entry of the *plmn-IdentityInfoList*;

5> include *frequencyBandList* if broadcasted;

4> else if MIB associated with the concerned *measObject* indicates that SIB1 is not broadcast*:*

5> include the *noSIB1* field;

1> for the cells included according to the previous (i.e. covering the PCell, the SCells, the best non-serving cells on serving frequencies as well as neighbouring EUTRA cells) include results according to the extended RSRQ if corresponding results are available according to the associated performance requirements defined in TS 36.133 [16];

1> if there is at least one applicable CSI-RS resource to report:

2> set the *measResultCSI-RS-List* to include the best CSI-RS resources up to *maxReportCells* in accordance with the following:

3> if the *triggerType* is set to *event*:

4> include the CSI-RS resources included in the *csi-RS-TriggeredList* as defined within the *VarMeasReportList* for this *measId*;

3> else:

4> include the applicable CSI-RS resources for which the new measurement results became available since the last periodical reporting or since the measurement was initiated or reset;

NOTE 2: The reliability of the report (i.e. the certainty it contains the strongest CSI-RS resources on the concerned frequency) depends on the measurement configuration i.e. the *reportInterval*. The related performance requirements are specified in TS 36.133 [16].

3> for each CSI-RS resource that is included in the *measResultCSI-RS-List*:

4> include the *measCSI-RS-Id*;

4> include the layer 3 filtered measured results in accordance with the *reportConfig* for this *measId*, ordered as follow:

5> set the *csi-RSRP-Result* to include the quantity indicated in the *reportQuantity* within the concerned *reportConfig* in order of decreasing *triggerQuantityCSI-RS*, i.e. the best CSI-RS resource is included first;

4> if *reportCRS-Meas* is set to *true* within the associated *reportConfig*, and the cell indicated by *physCellId* of this CSI-RS resource is not a serving cell:

5> set the *measResultNeighCells* to include the cell indicated by *physCellId* of this CSI-RS resource, and include the *physCellId*;

5> set the *rsrpResult* to include the RSRP of the concerned cell, if available according to performance requirements in TS 36.133 [16];

5> set the *rsrqResult* to include the RSRQ of the concerned cell, if available according to performance requirements in TS 36.133 [16];

1> if the *ue-RxTxTimeDiffPeriodical* is configured within the corresponding *reportConfig* for this *measId*;

2> set the *ue-RxTxTimeDiffResult* to the measurement result provided by lower layers;

2> set the *currentSFN*;

1> if the *measRSSI-ReportConfig* is configured within the corresponding *reportConfig* for this *measId:*

2> set the *rssi-Result* to the average of sample value(s) provided by lower layers in the *reportInterval*;

2> set the *channelOccupancy* to the rounded percentage of sample values which are beyond to the *channelOccupancyThreshold* within all the sample values in the *reportInterval*;

1> if the *measRSSI-ReportConfigNR* is configured within the corresponding *reportConfigInterRAT* for this *measId:*

2> set the *rssi-ResultNR* to the average of sample value(s) provided by lower layers in the *reportInterval*;

2> set the *channelOccupancyNR* to the rounded percentage of sample values which are beyond to the *channelOccupancyThresholdNR* within all the sample values in the *reportInterval*;

1> if uplink PDCP delay results are available:

2> set the *ul-PDCP-DelayResultList* to include the uplink PDCP delay results available;

1> if uplink PDCP delay value results are available:

2> set the *ul-PDCP-DelayValueResultList* to include the corresponding average uplink PDCP delay values;

1> if the *includeLocationInfo* is configured in the corresponding *reportConfig* for this *measId* or if *purpose* for the *reportConfig* associated with the *measId* that triggered the measurement reporting is set to *reportLocation*; and detailed location information that has not been reported is available, set the content of the *locationInfo* as follows:

2> include the *locationCoordinates*;

2> if available, include the *gnss-TOD-msec*, except if *purpose* for the *reportConfig* associated with the *measId* that triggered the measurement reporting is set to *reportLocation*;

2> include the *verticalVelocityInfo*, if available;

1> if the *coarseLocationReq* is set to *true* in the corresponding *reportConfig* for this *measId*:

2> if available, include the *coarseLocationInfo;*

1> if the *includeWLAN-Meas* is configured in the corresponding *reportConfig* for this *measId*, set the *measResults* as follows:

2> if available, include the *logMeasResultListWLAN*, in order of decreasing RSSI for WLAN APs;

1> if the *includeBT-Meas* is configured in the corresponding *reportConfig* for this *measId*, set the *measResults* as follows:

2> if available, include the *logMeasResultListBT*, in order of decreasing RSSI for Bluetooth beacons;

1> if the *includeUncomBarPreMeas* is configured in the corresponding *reportConfig* for this *measId* and if *includeUncomBarPreMeas* is set to *true*, set the *measResults* as follows:

2> if available, include the *uncomBarPreMeasResult*;

1> if the *reportSSTD-Meas* is set to *true* or *pSCell* within the corresponding *reportConfig* for this *measId*:

2> set the *measResultSSTD* to the measurement results provided by lower layers;

1> if the *reportSFTD-Meas* is set to *neighborCells* or *pSCell* within the corresponding *reportConfigInterRAT* for this *measId*, for each applicable cell for which results are available:

2> set *sfn-OffsetResult* and *frameBoundaryOffsetResult* to the measurement results provided by lower layers;

2> if the *ss-rsrp* in the *reportQuantityCellNR* is set to *TRUE* within the corresponding *reportConfigInterRAT* for this *measId*:

3> include *rsrpResult* set to the RSRP of the concerned cell;

1> if there is at least one applicable transmission resource pool to report:

2> set the *measResultListCBR* to include the CBR measurement results in accordance with the following:

3> if the *triggerType* is set to *event*:

4> include the transmission resource pools included in the *poolsTriggeredList* as defined within the *VarMeasReportList* for this *measId*;

3> else:

4> include the applicable transmission resource pools for which the new measurement results became available since the last periodical reporting or since the measurement was initiated or reset;

3> for each transmission resource pool to be reported:

4> set the *poolIdentity* to the *poolReportId* of this transmission resource pool;

4> if *adjacencyPSCCH-PSSCH* is set to *TRUE* for this transmission resource pool:

5> set the *cbr-PSSCH* to the CBR measurement result on PSSCH and PSCCH of this transmission resource pool provided by lower layers;

4> else:

5> set the *cbr-PSSCH* to the CBR measurement result on PSSCH of this transmission resource pool provided by lower layers if available;

5> set the *cbr-PSCCH* to the CBR measurement result on PSCCH of this transmission resource pool provided by lower layers if available;

2> set the *measResultSensing* to include the sensing measurement results in accordance with the following:

3> include the applicable transmission resource pools for which the new measurement results became available since the last periodical reporting or since the measurement was initiated or reset;

3> for each transmission resource pool to be reported:

4> set the *sensingResult* to the sensing measurement results provided by the lower layers;

1> if the *triggerType* is set to *event*; and if *eventId* is set to *eventH1* or *eventH2*:

2> set the *heightUE* to include the altitude of the UE;

1> increment the *numberOfReportsSent* as defined within the *VarMeasReportList* for this *measId* by 1;

1> stop the periodical reporting timer, if running;

1> if the *numberOfReportsSent* as defined within the *VarMeasReportList* for this *measId* is less than the *reportAmount* as defined within the corresponding *reportConfig* for this *measId*:

2> start the periodical reporting timer with the value of *reportInterval* as defined within the corresponding *reportConfig* for this *measId*;

1> else:

2> if the *triggerType* is set to *periodical*:

3> remove the entry within the *VarMeasReportList* for this *measId*;

3> remove this *measId* from the *measIdList* within *VarMeasConfig*;

1> if the measured results are for CDMA2000 HRPD:

2> set the *preRegistrationStatusHRPD* to the UE's CDMA2000 upper layer's HRPD *preRegistrationStatus*;

1> if the measured results are for CDMA2000 1xRTT:

2> set the preRegistrationStatusHRPD to *FALSE*;

1> if the measured results are for WLAN:

2> set the *measResultListWLAN* to include the quantities within the *quantityConfigWLAN* for up to *maxReportCells* WLAN(s), determined according to the following:

3> include WLAN the UE is connected to, if any;

3> if *reportAnyWLAN* is set to TRUE:

4> consider WLAN with any WLAN identifiers to be applicable for measurement reporting;

3> else:

4> consider only WLANs which do not match all WLAN identifiers of any entry within *wlan-MobilitySet* in *VarWLAN-MobilityConfig* to be applicable for measurement reporting;

3> include applicable WLAN in order of decreasing WLAN RSSI, i.e. the best WLAN is included first;

2> for each included WLAN:

3> set *wlan-Identifiers* to include all WLAN identifiers that can be acquired for the WLAN measured;

3> set *connectedWLAN* to *TRUE* if the UE is connected to the WLAN measured;

3> if *reportQuantityWLAN* existswithin the *ReportConfigInterRAT* within the *VarMeasConfig* for this *measId*:

4> if *bandRequestWLAN* is set to *TRUE*:

5> set *bandWLAN* to include WLAN band of the WLAN measured;

4> if *carrierInfoRequestWLAN* is set to *TRUE*:

5> set *carrierInfoWLAN* to include WLAN carrier information of the WLAN measured if it can be acquired;

4> if *availableAdmissionCapacityRequestWLAN* is set to *TRUE*:

5> set the *measResult* to include *avaiableAdmissionCapacityWLAN* if it can be acquired;

4> if *backhaulDL-BandwidthRequestWLAN* is set to *TRUE*:

5> set the *measResult* to include *backhaulDL-BandwidthWLAN* if it can be acquired;

4> if *backhaulUL-BandwidthRequestWLAN* is set to *TRUE*:

5> set the *measResult* to include *backhaulUL-BandwidthWLAN* if it can be acquired;

4> if *channelUtilizationRequestWLAN* is set to *TRUE*:

5> set the *measResult* to include *channelUtilizationWLAN* if it can be acquired;

4> if *stationCountRequestWLAN* is set to *TRUE*:

5> set the *measResult* to include *stationCountWLAN* if it can be acquired;

1> if the measurement configuration that triggered the measurement reporting procedure was configured by an *sl-ConfigDedicatedEUTRA* that was received within an NR *RRCReconfiguration* message:

2> submit the *MeasurementReport* message via SRB1 embedded in NR RRC message *ULInformationTransferIRAT* as specified in TS 38.331 [82].

1> else if the UE is configured with NE-DC:

2> submit the *MeasurementReport* message via SRB1 embedded in NR RRC message *ULInformationTransferMRDC* as specified in TS 38.331 [82].

1> else:

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

|  |
| --- |
| Next change |

### 5.6.3 UE capability transfer

#### 5.6.3.1 General



Figure 5.6.3.1-1: UE capability transfer

The purpose of this procedure is to transfer UE radio access capability information from the UE to E-UTRAN.

If the UE is NTN capable, the UE reports its E-UTRAN radio access capabilities for the network type (TN or NTN) to which it is connected.

If the UE has changed its E-UTRAN radio access capabilities, the UE shall request higher layers to initiate the necessary NAS procedures (see TS 23.401 [41]) that would result in the update of UE radio access capabilities using a new RRC connection.

NOTE: Change of the UE's GERAN UE radio capabilities in RRC\_IDLE is supported by use of Tracking Area Update.

|  |
| --- |
| Next change |

5.6.5 UE Information

5.6.5.1 General

****

**Figure 5.6.5.1-1: UE information procedure**

The UE information procedure is used by E-UTRAN to request the UE to report information.

5.6.5.2 Initiation

E-UTRAN initiates the procedure by sending the *UEInformationRequest* message. E-UTRAN should initiate this procedure only after successful security activation.

#### *5.6.5.3 Reception of the UEInformationRequest message*

Upon receiving the *UEInformationRequest* message, the UE shall, only after successful security activation:

1> if *rach-ReportReq* is set to *true*, set the contents of the *rach-Report* in the *UEInformationResponse* message as follows:

2> set the *numberOfPreamblesSent* to indicate the number of preambles sent by MAC for the last successfully completed random access procedure;

2> if contention resolution was not successful as specified in TS 36.321 [6] for at least one of the transmitted preambles for the last successfully completed random access procedure:

3> set the *contentionDetected* to *true*;

2> else:

3> set the *contentionDetected* to *false*;

2> if the UE is a BL UE or UE in CE:

3> set the *initialCEL* to indicate the initial CE level used for the last successfully completed random access procedure;

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

3> set the *initialNRSRP-Level* to indicate the NRSRP level of the NPRACH resource selected for the first preamble transmission for the last successfully completed random access procedure;

2> if the UE is a BL UE, UE in CE or NB-IoT UE:

3> if the last successfully completed random access procedure was initiated with EDT PRACH resource and succeeded after receiving EDT fallback indication from lower layers:

4> set the *edt-Fallback* to *true*;

3> else:

4> set the *edt-Fallback* to *false*;

1> if *rlf-ReportReq* is set to *true* and the UE has radio link failure information or handover failure information available in *VarRLF-Report* (*VarRLF-Report-NB* in NB-IoT) and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report*:

2> for NB-IoT, if the global cell identity of the selected cell is the same as the *reestablishmentCellId* in the *VarRLF-Report-NB*:

3> remove the *reestablishmentCellId* from the *VarRLF-Report-NB*;

2> set *timeSinceFailure* in *VarRLF-Report* (*VarRLF-Report-NB* in NB-IoT) to the time that elapsed since the last radio link or handover failure in E-UTRA;

2> set the *rlf-Report* in the *UEInformationResponse* message to the value of *rlf-Report* in *VarRLF-Report* (*VarRLF-Report-NB* in NB-IoT);

2> discard the *rlf-Report* from *VarRLF-Report* (*VarRLF-Report-NB* in NB-IoT) upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;

1> except for NB-IoT, if *connEstFailReportReq* is set to *true* and the UE has connection establishment failure information in *VarConnEstFailReport* and if the RPLMN is equal to *plmn-Identity* stored in *VarConnEstFailReport*:

2> set *timeSinceFailure* in *VarConnEstFailReport* to the time that elapsed since the last connection establishment failure in E-UTRA;

2> set the *connEstFailReport* in the *UEInformationResponse* message to the value of *connEstFailReport* in *VarConnEstFailReport*;

2> discard the *connEstFailReport* from *VarConnEstFailReport* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;

1> except for NB-IoT, if the *logMeasReportReq* is present and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:

2> if *VarLogMeasReport* includes one or more logged measurement entries, set the contents of the *logMeasReport* in the *UEInformationResponse* message as follows:

3> include the *absoluteTimeStamp* and set it to the value of *absoluteTimeInfo* in the *VarLogMeasReport*;

3> include the *traceReference* and set it to the value of *traceReference* in the *VarLogMeasReport*;

3> include the *traceRecordingSessionRef* and set it to the value of *traceRecordingSessionRef* in the *VarLogMeasReport;*

3> include the *tce-Id* and set it to the value of *tce-Id* in the *VarLogMeasReport*;

3> include the *logMeasInfoList* and set it to include one or more entries from the *VarLogMeasReport* starting from the entries logged first, and for each entry of the *logMeasInfoList* that is included, include all information stored in the corresponding *logMeasInfoList* entry in *VarLogMeasReport*;

3> if the *VarLogMeasReport* includes one or more additional logged measurement entries that are not included in the *logMeasInfoList* within the *UEInformationResponse* message:

4> include the *logMeasAvailable*;

4> if *logMeasResultListBT* is included in one or more of the additional logged measurement entries in *VarLogMeasReport* that are not included in the *logMeasInfoList* within the *UEInformationResponse* message:

5> include the *logMeasAvailableBT*;

4> if *logMeasResultListWLAN* is included in one or more of the additional logged measurement entries in *VarLogMeasReport* that are not included in the *logMeasInfoList* within the *UEInformationResponse* message:

5> include the *logMeasAvailableWLAN*;

1> except for NB-IoT, if *mobilityHistoryReportReq* is set to *true*:

2> include the *mobilityHistoryReport* and set it to include entries from *VarMobilityHistoryReport*;

2> include in the *mobilityHistoryReport* an entry for the current cell, possibly after removing the oldest entry if required, and set its fields as follows:

3> set *visitedCellId* to the global cell identity or the physical cell identity and carrier frequency of the current cell:

3> set field *timeSpent* to the time spent in the current cell;

1> except for NB-IoT, if the idleModeMeasurementReq is included in the UEInformationRequest and the UE has stored VarMeasIdleReport that contains measurement information concerning cells other than the PCell:

2> set the *measResultListIdle-r15* in the *UEInformationResponse* message to the value of *measReportIdle-r15* in the *VarMeasIdleReport*;

2> set the *measResultListExtIdle* in the *UEInformationResponse* message to the value of *measReportIdle-r16* in the *VarMeasIdleReport*, if available;

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

2> discard the *VarMeasIdleReport* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;

1> except for NB-IoT, if *flightPathInfoReq* field is present and the UE has flight path information available:

2> include the *flightPathInfoReport* and set it to include the list of waypoints along the flight path;

2> if the *includeTimeStamp* is set to TRUE:

3> set the field *timeStamp* to the time when UE intends to arrive to each waypoint if this information is available at the UE;

1> for NB-IoT, if *anr-ReportReq* is set to *true* and the UE has *measResultList* available in *VarANR-MeasReport-NB*:

2> set the *anr-MeasReport* in the *UEInformationResponse* message as follows:

3> if the global cell identity of the PCell is different from *servCellIdentity* in the *VarANR-MeasReport-NB*;

4> include the *servCellIdentity* and set it to the value of *servCellIdentity* in the *VarANR-MeasReport-NB*;

3> set *measResultServCell* to the value of *measResultServCell* in the *VarANR-MeasReport-NB*;

3> set *relativeTimeStamp* to the value of *relativeTimeStamp* in the *VarANR-MeasReport-NB*;

3> set *measResultList* to the value of *measResultList* in the *VarANR-MeasReport-NB*;

2> discard the *VarANR-MeasReport-NB* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;

1> except for NB-IoT, if the *coarseLocationReq* is set to true:

2> if available, include the *coarseLocationInfo;*

1> if the *logMeasReport* is included in the *UEInformationResponse*:

2> submit the *UEInformationResponse* message to lower layers for transmission via SRB2;

2> discard the logged measurement entries included in the *logMeasInfoList* from *VarLogMeasReport* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;

1> else:

2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1;

|  |
| --- |
| Next change |

## 6.2 RRC messages

NOTE: The messages included in this clause reflect the current status of the discussions. Additional messages may be included at a later stage.

### 6.2.1 General message structure

#### – *EUTRA-RRC-Definitions*

This ASN.1 segment is the start of the E‑UTRA RRC PDU definitions.

-- ASN1START

EUTRA-RRC-Definitions DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

-- ASN1STOP

#### – *BCCH-BCH-Message*

The *BCCH-BCH-Message* class is the set of RRC messages that may be sent from the E‑UTRAN to the UE via BCH on the BCCH logical channel.

-- ASN1START

BCCH-BCH-Message ::= SEQUENCE {

message BCCH-BCH-MessageType

}

BCCH-BCH-MessageType ::= MasterInformationBlock

-- ASN1STOP

#### – *BCCH-BCH-Message-MBMS*

The *BCCH-BCH-Message-MBMS* class is the set of RRC messages that may be sent from the E‑UTRAN to the UE via BCH on the BCCH logical channel in an MBMS-dedicated cell.

-- ASN1START

BCCH-BCH-Message*-*MBMS::= SEQUENCE {

message BCCH-BCH-MessageType*-*MBMS-r14

}

BCCH-BCH-MessageType-MBMS-r14 ::= MasterInformationBlock*-*MBMS-r14

-- ASN1STOP

#### – *BCCH-DL-SCH-Message*

The *BCCH-DL-SCH-Message* class is the set of RRC messages that may be sent from the E‑UTRAN to the UE via DL‑SCH on the BCCH logical channel.

-- ASN1START

BCCH-DL-SCH-Message ::= SEQUENCE {

message BCCH-DL-SCH-MessageType

}

BCCH-DL-SCH-MessageType ::= CHOICE {

c1 CHOICE {

systemInformation SystemInformation,

systemInformationBlockType1 SystemInformationBlockType1

},

messageClassExtension SEQUENCE {}

}

-- ASN1STOP

#### – *BCCH-DL-SCH-Message-BR*

The *BCCH-DL-SCH-Message-BR* class is the set of RRC messages that may be sent from the E‑UTRAN to the UE via DL-SCH on the BR-BCCH logical channel.

-- ASN1START

BCCH-DL-SCH-Message-BR ::= SEQUENCE {

message BCCH-DL-SCH-MessageType-BR-r13

}

BCCH-DL-SCH-MessageType-BR-r13 ::= CHOICE {

c1 CHOICE {

systemInformation-BR-r13 SystemInformation-BR-r13,

systemInformationBlockType1-BR-r13 SystemInformationBlockType1-BR-r13

},

messageClassExtension SEQUENCE {}

}

-- ASN1STOP

#### – *BCCH-DL-SCH-Message-MBMS*

The *BCCH-DL-SCH-Message-MBMS* class is the set of RRC messages that may be sent from the E‑UTRAN to the UE via DL‑SCH on the BCCH logical channel in an MBMS-dedicated cell.

-- ASN1START

BCCH-DL-SCH-Message-MBMS ::= SEQUENCE {

message BCCH-DL-SCH-MessageType-MBMS-r14

}

BCCH-DL-SCH-MessageType-MBMS-r14 ::= CHOICE {

c1 CHOICE {

systemInformation-MBMS-r14 SystemInformation-MBMS-r14,

systemInformationBlockType1-MBMS-r14 SystemInformationBlockType1-MBMS-r14

},

messageClassExtension SEQUENCE {}

}

-- ASN1STOP

#### – *MCCH-Message*

The *MCCH-Message* class is the set of RRC messages that may be sent from the E‑UTRAN to the UE on the MCCH logical channel.

-- ASN1START

MCCH-Message ::= SEQUENCE {

message MCCH-MessageType

}

MCCH-MessageType ::= CHOICE {

c1 CHOICE {

mbsfnAreaConfiguration-r9 MBSFNAreaConfiguration-r9

},

later CHOICE {

c2 CHOICE{

mbmsCountingRequest-r10 MBMSCountingRequest-r10

},

messageClassExtension SEQUENCE {}

}

}

-- ASN1STOP

#### – *PCCH-Message*

The *PCCH-Message* class is the set of RRC messages that may be sent from the E‑UTRAN to the UE on the PCCH logical channel.

-- ASN1START

PCCH-Message ::= SEQUENCE {

message PCCH-MessageType

}

PCCH-MessageType ::= CHOICE {

c1 CHOICE {

paging Paging

},

messageClassExtension SEQUENCE {}

}

-- ASN1STOP

#### – *DL-CCCH-Message*

The *DL-CCCH-Message* class is the set of RRC messages that may be sent from the E‑UTRAN to the UE on the downlink CCCH logical channel.

-- ASN1START

DL-CCCH-Message ::= SEQUENCE {

message DL-CCCH-MessageType

}

DL-CCCH-MessageType ::= CHOICE {

c1 CHOICE {

rrcConnectionReestablishment RRCConnectionReestablishment,

rrcConnectionReestablishmentReject RRCConnectionReestablishmentReject,

rrcConnectionReject RRCConnectionReject,

rrcConnectionSetup RRCConnectionSetup

},

messageClassExtension CHOICE {

c2 CHOICE {

rrcEarlyDataComplete-r15 RRCEarlyDataComplete-r15,

spare3 NULL, spare2 NULL, spare1 NULL

},

messageClassExtensionFuture-r15 SEQUENCE {}

}

}

-- ASN1STOP

#### – *DL-DCCH-Message*

The *DL-DCCH-Message* class is the set of RRC messages that may be sent from the E‑UTRAN to the UE or from the E-UTRAN to the RN on the downlink DCCH logical channel.

-- ASN1START

DL-DCCH-Message ::= SEQUENCE {

message DL-DCCH-MessageType

}

DL-DCCH-MessageType ::= CHOICE {

c1 CHOICE {

csfbParametersResponseCDMA2000 CSFBParametersResponseCDMA2000,

dlInformationTransfer DLInformationTransfer,

handoverFromEUTRAPreparationRequest HandoverFromEUTRAPreparationRequest,

mobilityFromEUTRACommand MobilityFromEUTRACommand,

rrcConnectionReconfiguration RRCConnectionReconfiguration,

rrcConnectionRelease RRCConnectionRelease,

securityModeCommand SecurityModeCommand,

ueCapabilityEnquiry UECapabilityEnquiry,

counterCheck CounterCheck,

ueInformationRequest-r9 UEInformationRequest-r9,

loggedMeasurementConfiguration-r10 LoggedMeasurementConfiguration-r10,

rnReconfiguration-r10 RNReconfiguration-r10,

rrcConnectionResume-r13 RRCConnectionResume-r13,

dlDedicatedMessageSegment-r16 DLDedicatedMessageSegment-r16,

spare2 NULL, spare1 NULL

},

messageClassExtension SEQUENCE {}

}

-- ASN1STOP

#### – *UL-CCCH-Message*

The *UL-CCCH-Message* class is the set of RRC messages that may be sent from the UE to the E‑UTRAN on the uplink CCCH logical channel.

-- ASN1START

UL-CCCH-Message ::= SEQUENCE {

message UL-CCCH-MessageType

}

UL-CCCH-MessageType ::= CHOICE {

c1 CHOICE {

rrcConnectionReestablishmentRequest RRCConnectionReestablishmentRequest,

rrcConnectionRequest RRCConnectionRequest

},

messageClassExtension CHOICE {

c2 CHOICE {

rrcConnectionResumeRequest-r13 RRCConnectionResumeRequest-r13

},

messageClassExtensionFuture-r13 CHOICE {

c3 CHOICE {

rrcEarlyDataRequest-r15 RRCEarlyDataRequest-r15,

spare3 NULL, spare2 NULL, spare1 NULL

},

messageClassExtensionFuture-r15 SEQUENCE {}

}

}

}

-- ASN1STOP

#### – *UL-DCCH-Message*

The *UL-DCCH-Message* class is the set of RRC messages that may be sent from the UE to the E‑UTRAN or from the RN to the E-UTRAN on the uplink DCCH logical channel.

-- ASN1START

UL-DCCH-Message ::= SEQUENCE {

message UL-DCCH-MessageType

}

UL-DCCH-MessageType ::= CHOICE {

c1 CHOICE {

csfbParametersRequestCDMA2000 CSFBParametersRequestCDMA2000,

measurementReport MeasurementReport,

rrcConnectionReconfigurationComplete RRCConnectionReconfigurationComplete,

rrcConnectionReestablishmentComplete RRCConnectionReestablishmentComplete,

rrcConnectionSetupComplete RRCConnectionSetupComplete,

securityModeComplete SecurityModeComplete,

securityModeFailure SecurityModeFailure,

ueCapabilityInformation UECapabilityInformation,

ulHandoverPreparationTransfer ULHandoverPreparationTransfer,

ulInformationTransfer ULInformationTransfer,

counterCheckResponse CounterCheckResponse,

ueInformationResponse-r9 UEInformationResponse-r9,

proximityIndication-r9 ProximityIndication-r9,

rnReconfigurationComplete-r10 RNReconfigurationComplete-r10,

mbmsCountingResponse-r10 MBMSCountingResponse-r10,

interFreqRSTDMeasurementIndication-r10 InterFreqRSTDMeasurementIndication-r10

},

messageClassExtension CHOICE {

c2 CHOICE {

ueAssistanceInformation-r11 UEAssistanceInformation-r11,

inDeviceCoexIndication-r11 InDeviceCoexIndication-r11,

mbmsInterestIndication-r11 MBMSInterestIndication-r11,

scgFailureInformation-r12 SCGFailureInformation-r12,

sidelinkUEInformation-r12 SidelinkUEInformation-r12,

wlanConnectionStatusReport-r13 WLANConnectionStatusReport-r13,

rrcConnectionResumeComplete-r13 RRCConnectionResumeComplete-r13,

ulInformationTransferMRDC-r15 ULInformationTransferMRDC-r15,

scgFailureInformationNR-r15 SCGFailureInformationNR-r15,

measReportAppLayer-r15 MeasReportAppLayer-r15,

failureInformation-r15 FailureInformation-r15,

ulDedicatedMessageSegment-r16 ULDedicatedMessageSegment-r16,

purConfigurationRequest-r16 PURConfigurationRequest-r16,

failureInformation-r16 FailureInformation-r16,

mcgFailureInformation-r16 MCGFailureInformation-r16,

ulInformationTransferIRAT-r16 ULInformationTransferIRAT-r16

},

messageClassExtensionFuture-r11

SEQUENCE {}

}

}

-- ASN1STOP

#### – *SC-MCCH-Message*

The *SC-MCCH-Message* class is the set of RRC messages that may be sent from the E‑UTRAN to the UE on the SC-MCCH logical channel.

-- ASN1START

SC-MCCH-Message-r13 ::= SEQUENCE {

message SC-MCCH-MessageType-r13

}

SC-MCCH-MessageType-r13 ::= CHOICE {

c1 CHOICE {

scptmConfiguration-r13 SCPTMConfiguration-r13

},

messageClassExtension CHOICE {

c2 CHOICE {

scptmConfiguration-BR-r14 SCPTMConfiguration-BR-r14,

spare NULL

},

messageClassExtensionFuture-r14 SEQUENCE {}

}

}

-- ASN1STOP

### 6.2.2 Message definitions

#### – *CounterCheck*

The *CounterCheck* message is used by the E-UTRAN to indicate the current COUNT MSB values associated to each DRB and to request the UE to compare these to its COUNT MSB values and to report the comparison results to E-UTRAN.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: E‑UTRAN to UE

*CounterCheck message*

-- ASN1START

CounterCheck ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

c1 CHOICE {

counterCheck-r8 CounterCheck-r8-IEs,

spare3 NULL, spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

CounterCheck-r8-IEs ::= SEQUENCE {

drb-CountMSB-InfoList DRB-CountMSB-InfoList,

nonCriticalExtension CounterCheck-v8a0-IEs OPTIONAL

}

CounterCheck-v8a0-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension CounterCheck-v1530-IEs OPTIONAL

}

CounterCheck-v1530-IEs ::= SEQUENCE {

drb-CountMSB-InfoListExt-r15 DRB-CountMSB-InfoListExt-r15 OPTIONAL, -- Need ON

nonCriticalExtension SEQUENCE {} OPTIONAL

}

DRB-CountMSB-InfoList ::= SEQUENCE (SIZE (1..maxDRB)) OF DRB-CountMSB-Info

DRB-CountMSB-InfoListExt-r15 ::= SEQUENCE (SIZE (1..maxDRBExt-r15)) OF DRB-CountMSB-Info

DRB-CountMSB-Info ::= SEQUENCE {

drb-Identity DRB-Identity,

countMSB-Uplink INTEGER(0..33554431),

countMSB-Downlink INTEGER(0..33554431)

}

-- ASN1STOP

| *CounterCheck* field descriptions |
| --- |
| ***count-MSB-Downlink***  If configured with E-UTRA PDCP, it indicates the value of 25 MSBs from downlink COUNT associated to this DRB. If configured with NR PDCP, it indicates the value of 25 MSBs from RX\_NEXT – 1 (specified in TS 38.323 [83]) associated to this DRB. |
| ***count-MSB-Uplink***  If configured with E-UTRA PDCP, it indicates the value of 25 MSBs from uplink COUNT associated to this DRB. If configured with NR PDCP, it indicates the value of 25 MSBs from TX\_NEXT – 1 (specified in TS 38.323 [83]) associated to this DRB. |
| ***drb-CountMSB-InfoList***  Indicates the MSBs of the COUNT values of the DRBs. |

#### – *CounterCheckResponse*

The *CounterCheckResponse* message is used by the UE to respond to a *CounterCheck* message.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E‑UTRAN

*CounterCheckResponse message*

-- ASN1START

CounterCheckResponse ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

counterCheckResponse-r8 CounterCheckResponse-r8-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

CounterCheckResponse-r8-IEs ::= SEQUENCE {

drb-CountInfoList DRB-CountInfoList,

nonCriticalExtension CounterCheckResponse-v8a0-IEs OPTIONAL

}

CounterCheckResponse-v8a0-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension CounterCheckResponse-v1530-IEs OPTIONAL

}

CounterCheckResponse-v1530-IEs ::= SEQUENCE {

drb-CountInfoListExt-r15 DRB-CountInfoListExt-r15 OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

DRB-CountInfoList ::= SEQUENCE (SIZE (0..maxDRB)) OF DRB-CountInfo

DRB-CountInfoListExt-r15 ::= SEQUENCE (SIZE (1..maxDRBExt-r15)) OF DRB-CountInfo

DRB-CountInfo ::= SEQUENCE {

drb-Identity DRB-Identity,

count-Uplink INTEGER(0..4294967295),

count-Downlink INTEGER(0..4294967295)

}

-- ASN1STOP

| *CounterCheckResponse* field descriptions |
| --- |
| ***count-Downlink***  If configured with E-UTRA PDCP, it indicates the value of downlink COUNT associated to this DRB. If configured with NR PDCP, it indicates the value of RX\_NEXT – 1 (specified in TS 38.323 [83]) associated to this DRB. |
| ***count-Uplink***  If configured with E-UTRA PDCP, it indicates the value of uplink COUNT associated to this DRB. If configured with NR PDCP, it indicates the value of TX\_NEXT – 1 (specified in TS 38.323 [83]) associated to this DRB. |
| ***drb-CountInfoList***  Indicates the COUNT values of the DRBs. |

#### – *CSFBParametersRequestCDMA2000*

The *CSFBParametersRequestCDMA2000* message is used by the UE to obtain the CDMA2000 1xRTT Parameters from the network. The UE needs these parameters to generate the CDMA2000 1xRTT Registration message used to register with the CDMA2000 1xRTT Network which is required to support CSFB to CDMA2000 1xRTT.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E‑UTRAN

*CSFBParametersRequestCDMA2000 message*

-- ASN1START

CSFBParametersRequestCDMA2000 ::= SEQUENCE {

criticalExtensions CHOICE {

csfbParametersRequestCDMA2000-r8 CSFBParametersRequestCDMA2000-r8-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

CSFBParametersRequestCDMA2000-r8-IEs ::= SEQUENCE {

nonCriticalExtension CSFBParametersRequestCDMA2000-v8a0-IEs OPTIONAL

}

CSFBParametersRequestCDMA2000-v8a0-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

#### – *CSFBParametersResponseCDMA2000*

The *CSFBParametersResponseCDMA2000* message is used to provide the CDMA2000 1xRTT Parameters to the UE so the UE can register with the CDMA2000 1xRTT Network to support CSFB to CDMA2000 1xRTT.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: E‑UTRAN to UE

*CSFBParametersResponseCDMA2000* message

-- ASN1START

CSFBParametersResponseCDMA2000 ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

csfbParametersResponseCDMA2000-r8 CSFBParametersResponseCDMA2000-r8-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

CSFBParametersResponseCDMA2000-r8-IEs ::= SEQUENCE {

rand RAND-CDMA2000,

mobilityParameters MobilityParametersCDMA2000,

nonCriticalExtension CSFBParametersResponseCDMA2000-v8a0-IEs OPTIONAL

}

CSFBParametersResponseCDMA2000-v8a0-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

#### – *DLDedicatedMessageSegment*

The *DLDedicatedMessageSegment* message is used to transfer one segment of the *RRCConnectionResume* or *RRCConnectionReconfiguration* messages.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: E-UTRAN to UE

*DLDedicatedMessageSegment* message

-- ASN1START

DLDedicatedMessageSegment-r16 ::= SEQUENCE {

criticalExtensions CHOICE {

dlDedicatedMessageSegment-r16 DLDedicatedMessageSegment-r16-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

DLDedicatedMessageSegment-r16-IEs ::= SEQUENCE {

segmentNumber-r16 INTEGER (0..4),

rrc-MessageSegmentContainer-r16 OCTET STRING,

rrc-MessageSegmentType-r16 ENUMERATED {notLastSegment, lastSegment},

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

|  |
| --- |
| *DLDedicatedMessageSegment* field descriptions |
| ***segmentNumber***  Identifies the sequence number of a segment within the encoded DL DCCH message. The network transmits the segments with continuously increasing *segmentNumber* order so that the UE's RRC layer may expect to obtain them from lower layers in the correct order. Hence, the UE is not required to perform segment re-ordering on RRC level. |
| ***rrc-MessageSegmentContainer***  Includes a segment of the encoded DL DCCH message. The size of the included segment in this container should be small enough so the resulting encoded RRC message PDU is less than or equal to the PDCP SDU size limit. |
| ***rrc-MessageSegmentType***  Indicates whether the included DL DCCH message segment is the last segment of the message or not. |

#### – *DLInformationTransfer*

The *DLInformationTransfer* message is used for the downlink transfer of NAS, non-3GPP dedicated information, IAB-DU specific F1-C related information, or time reference information.

NOTE: The UE may use the time reference information provided in the *timeReferenceInfo* IE for numerous purposes, possibly involving upper layers e.g. to synchronise the UE clock.

Signalling radio bearer: SRB2 or SRB1. If only *timeReferenceInfo* is included in the message, SRB1 is used. Otherwise, SRB1 is used only if SRB2 not established yet, and if SRB2 is suspended, E-UTRAN does not send this message until SRB2 is resumed. If only *dedicatedInfoF1c* is included, SRB2 is used.

RLC-SAP: AM

Logical channel: DCCH

Direction: E‑UTRAN to UE

*DLInformationTransfer message*

-- ASN1START

DLInformationTransfer ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

c1 CHOICE {

dlInformationTransfer-r8 DLInformationTransfer-r8-IEs,

dlInformationTransfer-r15 DLInformationTransfer-r15-IEs,

spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

DLInformationTransfer-r8-IEs ::= SEQUENCE {

dedicatedInfoType CHOICE {

dedicatedInfoNAS DedicatedInfoNAS,

dedicatedInfoCDMA2000-1XRTT DedicatedInfoCDMA2000,

dedicatedInfoCDMA2000-HRPD DedicatedInfoCDMA2000

},

nonCriticalExtension DLInformationTransfer-v8a0-IEs OPTIONAL

}

DLInformationTransfer-v8a0-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension DLInformationTransfer-v1610-IEs OPTIONAL

}

DLInformationTransfer-r15-IEs ::= SEQUENCE {

dedicatedInfoType-r15 CHOICE {

dedicatedInfoNAS-r15 DedicatedInfoNAS,

dedicatedInfoCDMA2000-1XRTT-r15 DedicatedInfoCDMA2000,

dedicatedInfoCDMA2000-HRPD-r15 DedicatedInfoCDMA2000

} OPTIONAL, -- Need ON

timeReferenceInfo-r15 TimeReferenceInfo-r15 OPTIONAL, -- Need ON

nonCriticalExtension DLInformationTransfer-v8a0-IEs OPTIONAL

}

DLInformationTransfer-v1610-IEs ::= SEQUENCE {

dedicatedInfoF1c-r16 DedicatedInfoF1c-r16 OPTIONAL, -- Need ON

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

#### – *FailureInformation*

The *FailureInformation* message is used to provide information regarding failures detected by the UE, e.g. radio link failure for one of the RLC entities configured with PDCP duplication or failure of a DAPS HO.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E‑UTRAN

*FailureInformation message*

-- ASN1START

FailureInformation-r15 ::= SEQUENCE {

failedLogicalChannelInfo-r15 FailedLogicalChannelInfo-r15 OPTIONAL

-- nonCriticalExtension is removed in this version as OPTIONAL was missing

}

FailureInformation-r16 ::= SEQUENCE {

criticalExtensions CHOICE {

failureInformation-r16 FailureInformation-r16-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

FailedLogicalChannelInfo-r15 ::= SEQUENCE {

failedLogicalChannelIdentity-r15 SEQUENCE {

cellGroupIndication-r15 ENUMERATED {mn, sn},

logicalChannelIdentity-r15 INTEGER (1..10) OPTIONAL,

logicalChannelIdentityExt-r15 INTEGER (32..38) OPTIONAL

},

failureType ENUMERATED {duplication, spare3, spare2, spare1}

}

FailureInformation-r16-IEs ::= SEQUENCE {

failedLogicalChannelIdentity-r16 FailedLogicalChannelIdentity-r16 OPTIONAL,

failureType-r16 ENUMERATED {duplication, dapsHO-failure,

spare2, spare1} OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

FailedLogicalChannelIdentity-r16 ::= SEQUENCE {

cellGroupIndication-r16 ENUMERATED {mn, sn},

logicalChannelIdentity-r16 INTEGER (1..10) OPTIONAL,

logicalChannelIdentityExt-r16 INTEGER (32..38) OPTIONAL

}

-- ASN1STOP

| *FailureInformation* field descriptions |
| --- |
| ***cellGroupIndication***  This field indicates the cell group (MCG, SCG) of the RLC entity for which the PDCP duplication failure occurred. |
| ***failureType***  This field indicates the type of failure reported. Value *duplication* indicates that a radio link failure for one of the RLC entities configured with PDCP duplication has been detected. Value *dapsHO-failure* indicates that timer T304 expired during a DAPS HO. |
| ***logicalChannelIdentity, logicalChannelIdentityExt***  This field indicates the logical channel identity of the RLC entity for which the PDCP duplication failure occurred. |

NOTE: The UE may apply the *FailureInformation-r16* message to report a failure defined in REL-15, but only if it is configured with a feature incorporating a failure that can only be reported by the *FailureInformation-r16* message.

#### – *HandoverFromEUTRAPreparationRequest* (CDMA2000)

The *HandoverFromEUTRAPreparationRequest* message is used to trigger the handover preparation procedure with a CDMA2000 RAT. This message is also used to trigger a tunneled preparation procedure with a CDMA2000 1xRTT RAT to obtain traffic channel resources for the enhanced CS fallback to CDMA2000 1xRTT, which may also involve a concurrent preparation for handover to CDMA2000 HRPD. Also, this message is used to trigger the dual Rx/Tx redirection procedure with a CDMA2000 1xRTT RAT.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: E‑UTRAN to UE

*HandoverFromEUTRAPreparationRequest message*

-- ASN1START

HandoverFromEUTRAPreparationRequest ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

c1 CHOICE {

handoverFromEUTRAPreparationRequest-r8 HandoverFromEUTRAPreparationRequest-r8-IEs,

spare3 NULL, spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

HandoverFromEUTRAPreparationRequest-r8-IEs ::= SEQUENCE {

cdma2000-Type CDMA2000-Type,

rand RAND-CDMA2000 OPTIONAL, -- Cond cdma2000-Type

mobilityParameters MobilityParametersCDMA2000 OPTIONAL, -- Cond cdma2000-Type

nonCriticalExtension HandoverFromEUTRAPreparationRequest-v890-IEs OPTIONAL

}

HandoverFromEUTRAPreparationRequest-v890-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension HandoverFromEUTRAPreparationRequest-v920-IEs OPTIONAL

}

HandoverFromEUTRAPreparationRequest-v920-IEs ::= SEQUENCE {

concurrPrepCDMA2000-HRPD-r9 BOOLEAN OPTIONAL, -- Cond cdma2000-Type

nonCriticalExtension HandoverFromEUTRAPreparationRequest-v1020-IEs OPTIONAL

}

HandoverFromEUTRAPreparationRequest-v1020-IEs ::= SEQUENCE {

dualRxTxRedirectIndicator-r10 ENUMERATED {true} OPTIONAL, -- Cond cdma2000-1XRTT

redirectCarrierCDMA2000-1XRTT-r10 CarrierFreqCDMA2000 OPTIONAL, -- Cond dualRxTxRedirect

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

| *HandoverFromEUTRAPreparationRequest* field descriptions |
| --- |
| ***concurrPrepCDMA2000-HRPD***  Value TRUE indicates that upper layers should initiate concurrent preparation for handover to CDMA2000 HRPD in addition to preparation for enhanced CS fallback to CDMA2000 1xRTT. |
| ***dualRxTxRedirectIndicator***  Value TRUE indicates that the second radio of the dual Rx/Tx UE is being redirected to CDMA2000 1xRTT, as specified in TS 23.272 [51]. |
| ***redirectCarrierCDMA2000-1XRTT***  Used to indicate the CDMA2000 1xRTT carrier frequency where the UE is being redirected to. |

| Conditional presence | Explanation |
| --- | --- |
| *cdma2000-1XRTT* | The field is optionally present, need ON, if the *cdma2000-Type* = *type1XRTT*; otherwise it is not present. |
| *cdma2000-Type* | The field is mandatory present if the *cdma2000-Type* = *type1XRTT*; otherwise it is not present. |
| *dualRxTxRedirect* | The field is optionally present, need ON, if *dualRxTxRedirectIndicator* is present; otherwise it is not present. |

#### *– InDeviceCoexIndication*

The *InDeviceCoexIndication* message is used to inform E-UTRAN about IDC problems which can not be solved by the UE itself, as well as to provide information that may assist E-UTRAN when resolving these problems.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E‑UTRAN

*InDeviceCoexIndication message*

-- ASN1START

InDeviceCoexIndication-r11 ::= SEQUENCE {

criticalExtensions CHOICE {

c1 CHOICE {

inDeviceCoexIndication-r11 InDeviceCoexIndication-r11-IEs,

spare3 NULL, spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

InDeviceCoexIndication-r11-IEs ::= SEQUENCE {

affectedCarrierFreqList-r11 AffectedCarrierFreqList-r11 OPTIONAL,

tdm-AssistanceInfo-r11 TDM-AssistanceInfo-r11 OPTIONAL,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension InDeviceCoexIndication-v11d0-IEs OPTIONAL

}

InDeviceCoexIndication-v11d0-IEs ::= SEQUENCE {

ul-CA-AssistanceInfo-r11 SEQUENCE {

affectedCarrierFreqCombList-r11 AffectedCarrierFreqCombList-r11 OPTIONAL,

victimSystemType-r11 VictimSystemType-r11

} OPTIONAL,

nonCriticalExtension InDeviceCoexIndication-v1310-IEs OPTIONAL

}

InDeviceCoexIndication-v1310-IEs ::= SEQUENCE {

affectedCarrierFreqList-v1310 AffectedCarrierFreqList-v1310 OPTIONAL,

affectedCarrierFreqCombList-r13 AffectedCarrierFreqCombList-r13 OPTIONAL,

nonCriticalExtension InDeviceCoexIndication-v1360-IEs OPTIONAL

}

InDeviceCoexIndication-v1360-IEs ::= SEQUENCE {

hardwareSharingProblem-r13 ENUMERATED {true} OPTIONAL,

nonCriticalExtension InDeviceCoexIndication-v1530-IEs OPTIONAL

}

InDeviceCoexIndication-v1530-IEs ::= SEQUENCE {

mrdc-AssistanceInfo-r15 MRDC-AssistanceInfo-r15 OPTIONAL,

nonCriticalExtension InDeviceCoexIndication-v1610-IEs OPTIONAL

}

InDeviceCoexIndication-v1610-IEs::= SEQUENCE {

victimSystemType-v1610 VictimSystemType-v1610 OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

AffectedCarrierFreqList-r11 ::= SEQUENCE (SIZE (1..maxFreqIDC-r11)) OF AffectedCarrierFreq-r11

AffectedCarrierFreqList-v1310 ::= SEQUENCE (SIZE (1..maxFreqIDC-r11)) OF AffectedCarrierFreq-v1310

AffectedCarrierFreq-r11 ::= SEQUENCE {

carrierFreq-r11 MeasObjectId,

interferenceDirection-r11 ENUMERATED {eutra, other, both, spare}

}

AffectedCarrierFreq-v1310 ::= SEQUENCE {

carrierFreq-v1310 MeasObjectId-v1310 OPTIONAL

}

AffectedCarrierFreqCombList-r11 ::= SEQUENCE (SIZE (1..maxCombIDC-r11)) OF AffectedCarrierFreqComb-r11

AffectedCarrierFreqCombList-r13 ::= SEQUENCE (SIZE (1..maxCombIDC-r11)) OF AffectedCarrierFreqComb-r13

AffectedCarrierFreqComb-r11 ::= SEQUENCE (SIZE (2..maxServCell-r10)) OF MeasObjectId

AffectedCarrierFreqComb-r13 ::= SEQUENCE (SIZE (2..maxServCell-r13)) OF MeasObjectId-r13

TDM-AssistanceInfo-r11 ::= CHOICE {

drx-AssistanceInfo-r11 SEQUENCE {

drx-CycleLength-r11 ENUMERATED {sf40, sf64, sf80, sf128, sf160,

sf256, spare2, spare1},

drx-Offset-r11 INTEGER (0..255) OPTIONAL,

drx-ActiveTime-r11 ENUMERATED {sf20, sf30, sf40, sf60, sf80,

sf100, spare2, spare1}

},

idc-SubframePatternList-r11 IDC-SubframePatternList-r11,

...

}

IDC-SubframePatternList-r11 ::= SEQUENCE (SIZE (1..maxSubframePatternIDC-r11)) OF IDC-SubframePattern-r11

IDC-SubframePattern-r11 ::= CHOICE {

subframePatternFDD-r11 BIT STRING (SIZE (4)),

subframePatternTDD-r11 CHOICE {

subframeConfig0-r11 BIT STRING (SIZE (70)),

subframeConfig1-5-r11 BIT STRING (SIZE (10)),

subframeConfig6-r11 BIT STRING (SIZE (60))

},

...

}

VictimSystemType-r11 ::= SEQUENCE {

gps-r11 ENUMERATED {true} OPTIONAL,

glonass-r11 ENUMERATED {true} OPTIONAL,

bds-r11 ENUMERATED {true} OPTIONAL,

galileo-r11 ENUMERATED {true} OPTIONAL,

wlan-r11 ENUMERATED {true} OPTIONAL,

bluetooth-r11 ENUMERATED {true} OPTIONAL

}

VictimSystemType-v1610 ::= SEQUENCE {

navic-r16 ENUMERATED {true} OPTIONAL

}

MRDC-AssistanceInfo-r15 ::= SEQUENCE {

affectedCarrierFreqCombInfoListMRDC-r15 SEQUENCE (SIZE (1..maxCombIDC-r11)) OF AffectedCarrierFreqCombInfoMRDC-r15,

...,

[[ affectedCarrierFreqCombInfoListMRDC-v1610 SEQUENCE (SIZE (1..maxCombIDC-r11)) OF VictimSystemType-v1610 OPTIONAL

]]

}

AffectedCarrierFreqCombInfoMRDC-r15 ::= SEQUENCE {

victimSystemType-r15 VictimSystemType-r11,

interferenceDirectionMRDC-r15 ENUMERATED {eutra-nr, nr, other, eutra-nr-other,

nr-other, spare3, spare2, spare1},

affectedCarrierFreqCombMRDC-r15 SEQUENCE {

affectedCarrierFreqCombEUTRA-r15 AffectedCarrierFreqComb-r15 OPTIONAL,

affectedCarrierFreqCombNR-r15 AffectedCarrierFreqCombNR-r15

} OPTIONAL

}

AffectedCarrierFreqComb-r15 ::= SEQUENCE (SIZE (1..maxServCell-r13)) OF MeasObjectId-r13

AffectedCarrierFreqCombNR-r15 ::= SEQUENCE (SIZE (1..maxServCellNR-r15)) OF ARFCN-ValueNR-r15

-- ASN1STOP

| *InDeviceCoexIndication* field descriptions |
| --- |
| ***AffectedCarrierFreq***  If *carrierFreq-v1310* is included, *carrierFreq-r11* is ignored by eNB. |
| ***affectedCarrierFreqCombList***  Indicates a list of E-UTRA carrier frequencies that are affected by IDC problems due to Inter-Modulation Distortion and harmonics from E-UTRA when configured with UL CA. *affectedCarrierFreqCombList-r13* is used when more than 5 serving cells are configured or affected combinations contain *MeasObjectId* larger than 32. If *affectedCarrierFreqCombList-r13* is included, *affectedCarrierFreqCombList-r11* shall not be included. |
| ***affectedCarrierFreqCombMRDC***  Indicates a set of at least one NR carrier frequency and optionally one or more E-UTRA carrier frequency that is affected by IDC problems due to Inter-Modulation Distortion and harmonics when configured with MR-DC. |
| ***affectedCarrierFreqList***  List of E-UTRA carrier frequencies affected by IDC problems. If E-UTRAN includes *affectedCarrierFreqList-v1310* it includes the same number of entries, and listed in the same order, as in *affectedCarrierFreqList-r11*. |
| ***drx-ActiveTime***  Indicates the desired active time that the E-UTRAN is recommended to configure. Value in number of subframes. Value sf20 corresponds to 20 subframes, sf30 corresponds to 30 subframes and so on. |
| ***drx-CycleLength***  Indicates the desired DRX cycle length that the E-UTRAN is recommended to configure. Value in number of subframes. Value sf40 corresponds to 40 subframes, sf64 corresponds to 64 subframes and so on. |
| ***drx-Offset***  Indicates the desired DRX starting offset that the E-UTRAN is recommended to configure. The UE shall set the value of drx-Offset smaller than the value of *drx-CycleLength*. The starting frame and subframe satisfy the relation: [(SFN \* 10) + subframe number] modulo (*drx-CycleLength*) = *drx-Offset*. |
| ***hardwareSharingProblem***  Indicates whether the UE has hardware sharing problems that the UE cannot solve by itself. The field is present (i.e. value *true*), if the UE has such hardware sharing problems. Otherwise the field is absent. |
| ***idc-SubframePatternList***  A list of one or more subframe patterns indicating which HARQ process E-UTRAN is requested to abstain from using. Value 0 indicates that E-UTRAN is requested to abstain from using the subframe. For FDD, the radio frame in which the pattern starts (i.e. the radio frame in which the first/leftmost bit of the *subframePatternFDD* corresponds to subframe #0) occurs when SFN mod 2 = 0. For TDD, 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. The UE shall indicate a subframe pattern that follows HARQ time line, as specified in TS 36.213 [23], i.e, if a subframe is set to 1 in the subframe pattern, also the corresponding subframes carrying the potential UL grant, as specified in TS 36.213 [23], clause 8.0, the UL HARQ retransmission, as specified in TS 36.213 [23], clause 8.0, and the DL/UL HARQ feedback, as specified in TS 36.213 [23], clauses 7.3, 8.3 and 9.1.2, shall be set to 1. |
| ***interferenceDirection***  Indicates the direction of IDC interference. Value *eutra* indicates that only E-UTRA is victim of IDC interference, value *other* indicates that only another radio is victim of IDC interference and value *both* indicates that both E-UTRA and another radio are victims of IDC interference. The other radio refers to either the ISM radio or GNSS (see TR 36.816 [63]). |
| ***interferenceDirectionMRDC***  Indicates the direction of IDC interference. Value *eutra-nr* indicates E-UTRA and NR is victim, value *nr* indicates NR, value *other* indicates other radio system and so on. The other radio refers to either the ISM radio or GNSS (see TR 36.816 [63]). |
| ***victimSystemType***  Indicate the list of victim system types to which IDC interference is caused from E-UTRA when configured with UL CA or from E-UTRA and NR when configured with MR-DC. *gps*, *glonass*, *bds*, *galileo*, *and navic* indicate the type of GNSS. Value *wlan* indicates WLAN and value *bluetooth* indicates Bluetooth. |

#### – *InterFreqRSTDMeasurementIndication*

The *InterFreqRSTDMeasurementIndication* message is used to indicate that the UE is going to either start or stop OTDOA inter-frequency RSTD measurement which requires measurement gaps as specified in TS 36.133 [16], clause 8.1.2.6. The *InterFreqRSTDMeasurementIndication* message is also used to indicate to the network that the UE is going to start/stop OTDOA intra-frequency RSTD measurements which require measurement gaps. The *InterFreqRSTDMeasurementIndication* message is also used to indicate to the network the measurement gap that the category M1 or M2 UE prefers to perform RSTD measurements with dense PRS configuration, as specified in TS 36.133 [16], Table 8.1.2.1-3.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E‑UTRAN

*InterFreqRSTDMeasurementIndication message*

-- ASN1START

InterFreqRSTDMeasurementIndication-r10 ::= SEQUENCE {

criticalExtensions CHOICE {

c1 CHOICE {

interFreqRSTDMeasurementIndication-r10 InterFreqRSTDMeasurementIndication-r10-IEs,

spare3 NULL, spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

InterFreqRSTDMeasurementIndication-r10-IEs ::= SEQUENCE {

rstd-InterFreqIndication-r10 CHOICE {

start SEQUENCE {

rstd-InterFreqInfoList-r10 RSTD-InterFreqInfoList-r10

},

stop NULL

},

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

RSTD-InterFreqInfoList-r10 ::= SEQUENCE (SIZE(1..maxRSTD-Freq-r10)) OF RSTD-InterFreqInfo-r10

RSTD-InterFreqInfo-r10 ::= SEQUENCE {

carrierFreq-r10 ARFCN-ValueEUTRA,

measPRS-Offset-r10 INTEGER (0..39),

...,

[[ carrierFreq-v1090 ARFCN-ValueEUTRA-v9e0 OPTIONAL

]],

[[ measPRS-Offset-r15 CHOICE {

rstd0-r15 INTEGER (0..79),

rstd1-r15 INTEGER (0..159),

rstd2-r15 INTEGER (0..319),

rstd3-r15 INTEGER (0..639),

rstd4-r15 INTEGER (0..1279),

rstd5-r15 INTEGER (0..159),

rstd6-r15 INTEGER (0..319),

rstd7-r15 INTEGER (0..639),

rstd8-r15 INTEGER (0..1279),

rstd9-r15 INTEGER (0..319),

rstd10-r15 INTEGER (0..639),

rstd11-r15 INTEGER (0..1279),

rstd12-r15 INTEGER (0..319),

rstd13-r15 INTEGER (0..639),

rstd14-r15 INTEGER (0..1279),

rstd15-r15 INTEGER (0..639),

rstd16-r15 INTEGER (0..1279),

rstd17-r15 INTEGER (0..639),

rstd18-r15 INTEGER (0..1279),

rstd19-r15 INTEGER (0..639),

rstd20-r15 INTEGER (0..1279)

} OPTIONAL

]]

}

-- ASN1STOP

| *InterFreqRSTDMeasurementIndication* field descriptions |
| --- |
| ***carrierFreq***  The EARFCN value of the carrier received from upper layers for which the UE needs to perform the inter-frequency RSTD measurements. If the UE includes *carrierFreq-v1090*, it shall set *carrierFreq-r10* to *maxEARFCN*. In case the UE starts intra-frequency RSTD measurements the *carrierFreq* indicates the carrier frequency of the serving cell. |
| ***measPRS-Offset***  Indicates the requested gap offset for performing inter-frequency or intra-frequency RSTD measurements. It is the smallest subframe offset from the beginning of subframe 0 of SFN=0 of the serving cell of the requested gap for measuring PRS positioning occasions in the carrier frequency *carrierFreq* for which the UE needs to perform the inter-frequency or intra-frequency RSTD measurements. The PRS positioning occasion information is received from upper layers. The value of *measPRS-Offset-r10* is obtained by mapping the starting subframe of the PRS positioning occasion in the measured cell onto the corresponding subframe in the serving cell and is calculated as the serving cell's number of subframes from SFN=0 mod 40.  If *measPRS-Offset-r15* is included, the field further indicates the requested gap pattern that the category M1 or M2 UE prefers to perform RSTD measurements with dense PRS configuration, as specified in TS 36.133 [16], Table 8.1.2.1-3, where value rstd0 corresponds to Gap Pattern Id rstd0, value rstd1 corresponds to Gap Pattern Id rstd1 and so on. The value of *measPRS-Offset-r15* is obtained by mapping the starting subframe of the PRS positioning occasion in the measured cell onto the corresponding subframe in the serving cell and is calculated as the serving cell's number of subframes from SFN=0 mod MGRP corresponding to the requested Gap pattern Id. If *measPRS-Offset-r15* is included, *measPRS-Offset-r10* is ignored.  The UE shall take into account any additional time required by the UE to start PRS measurements on the other carrier when it does this mapping for determining the *measPRS-Offset*.  NOTE: Figure 6.2.2-1 illustrates the *measPRS-Offset* field. |
| ***rstd-InterFreqIndication***  Indicates the inter-frequency or intra-frequency RSTD measurement action, i.e. the UE is going to start or stop inter-frequency or intra-frequency RSTD measurement. |



Figure 6.2.2-1 (informative): Exemplary calculation of *measPRS-Offset* field.

#### – *LoggedMeasurementConfiguration*

The *LoggedMeasurementConfiguration* message is used by E-UTRAN to configure the UE to perform logging of measurement results while in RRC\_IDLE or to perform logging of measurement results for MBSFN while in both RRC\_IDLE and RRC\_CONNECTED. It is used to transfer the logged measurement configuration for network performance optimisation, see TS 37.320 [60].

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: E-UTRAN to UE

*LoggedMeasurementConfiguration message*

-- ASN1START

LoggedMeasurementConfiguration-r10 ::= SEQUENCE {

criticalExtensions CHOICE {

c1 CHOICE {

loggedMeasurementConfiguration-r10 LoggedMeasurementConfiguration-r10-IEs,

spare3 NULL, spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

LoggedMeasurementConfiguration-r10-IEs ::= SEQUENCE {

traceReference-r10 TraceReference-r10,

traceRecordingSessionRef-r10 OCTET STRING (SIZE (2)),

tce-Id-r10 OCTET STRING (SIZE (1)),

absoluteTimeInfo-r10 AbsoluteTimeInfo-r10,

areaConfiguration-r10 AreaConfiguration-r10 OPTIONAL, -- Need OR

loggingDuration-r10 LoggingDuration-r10,

loggingInterval-r10 LoggingInterval-r10,

nonCriticalExtension LoggedMeasurementConfiguration-v1080-IEs OPTIONAL

}

LoggedMeasurementConfiguration-v1080-IEs ::= SEQUENCE {

lateNonCriticalExtension-r10 OCTET STRING OPTIONAL,

nonCriticalExtension LoggedMeasurementConfiguration-v1130-IEs OPTIONAL

}

LoggedMeasurementConfiguration-v1130-IEs ::= SEQUENCE {

plmn-IdentityList-r11 PLMN-IdentityList3-r11 OPTIONAL, -- Need OR

areaConfiguration-v1130 AreaConfiguration-v1130 OPTIONAL, -- Need OR

nonCriticalExtension LoggedMeasurementConfiguration-v1250-IEs OPTIONAL

}

LoggedMeasurementConfiguration-v1250-IEs ::= SEQUENCE {

targetMBSFN-AreaList-r12 TargetMBSFN-AreaList-r12 OPTIONAL, -- Need OP

nonCriticalExtension LoggedMeasurementConfiguration-v1530-IEs OPTIONAL

}

LoggedMeasurementConfiguration-v1530-IEs ::= SEQUENCE {

bt-NameList-r15 BT-NameList-r15 OPTIONAL, --Need OR

wlan-NameList-r15 WLAN-NameList-r15 OPTIONAL, --Need OR

nonCriticalExtension LoggedMeasurementConfiguration-v1700-IEs OPTIONAL

}

LoggedMeasurementConfiguration-v1700-IEs ::= SEQUENCE {

loggedEventTriggerConfig-r17 LoggedEventTriggerConfig-r17 OPTIONAL, --Need OR

measUncomBarPre-r17 ENUMERATED {true} OPTIONAL, --Need OR

nonCriticalExtension SEQUENCE {} OPTIONAL

}

TargetMBSFN-AreaList-r12 ::= SEQUENCE (SIZE (0..maxMBSFN-Area)) OF TargetMBSFN-Area-r12

TargetMBSFN-Area-r12 ::= SEQUENCE {

mbsfn-AreaId-r12 MBSFN-AreaId-r12 OPTIONAL, -- Need OR

carrierFreq-r12 ARFCN-ValueEUTRA-r9,

...

}

LoggedEventTriggerConfig-r17 ::= SEQUENCE {

eventType-r17 EventType-r17

}

EventType-r17 ::= CHOICE {

outOfCoverage NULL,

eventL1 SEQUENCE {

l1-Threshold-r17 ThresholdEUTRA,

hysteresis-r17 Hysteresis,

timeToTrigger-r17 TimeToTrigger

},

...

}

-- ASN1STOP

| *LoggedMeasurementConfiguration* field descriptions |
| --- |
| ***absoluteTimeInfo***  Indicates the absolute time in the current cell. |
| ***areaConfiguration***  Used to restrict the area in which the UE performs measurement logging to cells broadcasting either one of the included cell identities or one of the included tracking area codes/ identities. |
| ***eventType***  The value *outOfCoverage* indicates the UE to perform logging of measurements when the UE enters *any cell selection* state, and the value *eventL1* indicates the UE to perform logging of measurements when the triggering condition (similar as event A2 as specified in 5.5.4.3) as configured in the event is met for the camping cell in *camped normally* state. |
| ***measUncomBarPre***  If configured, the UE attempts to perform the uncompensated Barometeric pressure measurement as defined in TS 37.355 [109]. |
| ***plmn-IdentityList***  Indicates a set of PLMNs defining when the UE performs measurement logging as well as the associated status indication and information retrieval i.e. the UE performs these actions when the RPLMN is part of this set of PLMNs. |
| ***targetMBSFN-AreaList***  Used to indicate logging of MBSFN measurements and further restrict the area and frequencies for which the UE performs measurement logging for MBSFN. If both MBSFN area id and carrier frequency are present, a specific MBSFN area is indicated. If only carrier frequency is present, all MBSFN areas on that carrier frequency are indicated. If there is no entry in the list, any MBSFN area is indicated. |
| ***tce-Id***  Parameter Trace Collection Entity Id: See TS 32.422 [58]. |
| ***traceRecordingSessionRef***  Parameter Trace Recording Session Reference: See TS 32.422 [58] |

#### – *MasterInformationBlock*

The *MasterInformationBlock* includes the system information transmitted on BCH.

Signalling radio bearer: N/A

RLC-SAP: TM

Logical channel: BCCH

Direction: E‑UTRAN to UE

*MasterInformationBlock*

-- ASN1START

MasterInformationBlock ::= SEQUENCE {

dl-Bandwidth ENUMERATED {

n6, n15, n25, n50, n75, n100},

phich-Config PHICH-Config,

systemFrameNumber BIT STRING (SIZE (8)),

schedulingInfoSIB1-BR-r13 INTEGER (0..31),

systemInfoUnchanged-BR-r15 BOOLEAN,

partEARFCN-17 CHOICE {

spare BIT STRING (SIZE (2)),

earfcn-LSB BIT STRING (SIZE (2))

},

spare BIT STRING (SIZE (1))

}

-- ASN1STOP

| *MasterInformationBlock* field descriptions |
| --- |
| ***dl-Bandwidth***  Parameter: transmission bandwidth configuration, NRB in downlink, see TS 36.101 [42], table 5.6-1. n6 corresponds to 6 resource blocks, n15 to 15 resource blocks and so on. |
| ***earfcn-LSB***  Indicates the 2 least significant bits of the EARFCN for NTN bands where 100 kHz raster is used, see TS 36.101 [42]. |
| ***phich-Config***  Specifies the PHICH configuration. If the UE is a BL UE or UE in CE, it shall ignore this field. |
| ***schedulingInfoSIB1-BR***  Indicates the index to the tables that define *SystemInformationBlockType1-BR* scheduling information. The tables are specified in TS 36.213 [23], Table 7.1.6-1 and Table 7.1.7.2.7-1. Value 0 means that *SystemInformationBlockType1-BR* is not scheduled. |
| ***systemFrameNumber***  Defines the 8 most significant bits of the SFN. As indicated in TS 36.211 [21], 6.6.1, the 2 least significant bits of the SFN are acquired implicitly in the P-BCH decoding, i.e. timing of 40ms P-BCH TTI indicates 2 least significant bits (within 40ms P-BCH TTI, the first radio frame: 00, the second radio frame: 01, the third radio frame: 10, the last radio frame: 11). One value applies for all serving cells of a Cell Group (i.e. MCG or SCG). The associated functionality is common (i.e. not performed independently for each cell). |
| ***systemInfoUnchanged-BR***  Value TRUE indicates that no change has occurred in the SIB1-BR and SI messages at least over the SI validity time.  NOTE: Value of *systemInfoUnchanged-BR* is also carried in RSS (if transmitted), see TS 36.211 [21]. |

#### – *MasterInformationBlock-MBMS*

The *MasterInformationBlock-MBMS* includes the system information transmitted on BCH.

Signalling radio bearer: N/A

RLC-SAP: TM

Logical channel: BCCH

Direction: E‑UTRAN to UE

*MasterInformationBlock-MBMS*

-- ASN1START

MasterInformationBlock-MBMS-r14 ::= SEQUENCE {

dl-Bandwidth-MBMS-r14 ENUMERATED {

n6, n15, n25, n50, n75, n100},

systemFrameNumber-r14 BIT STRING (SIZE (6)),

additionalNonMBSFNSubframes-r14 INTEGER (0..3),

semiStaticCFI-MBMS-r16 INTEGER (0..3),

spare BIT STRING (SIZE (11))

}

-- ASN1STOP

| *MasterInformationBlock-MBMS* field descriptions |
| --- |
| ***additionalNonMBSFNSubframes***  Configures additional non-MBSFN subframes where *SystemInformationBlockType1-MBMS* and *SystemInformation-MBMS* may be transmitted. Value 0, 1, 2, 3 mean zero, one, two, three additional non-MBSFN subframes are configured after each subframe which has PBCH. |
| ***dl-Bandwidth-MBMS***  Parameter: transmission bandwidth configuration, NRB in downlink, see TS 36.101 [42], table 5.6-1. n6 corresponds to 6 resource blocks, n15 to 15 resource blocks and so on. |
| ***semiStaticCFI-MBMS***  Indicates semi-static value of CFI as specified in TS 36.213 [23], clause 9.1.3. If value 0 is indicated, CFI is obtained from PCFICH, otherwise the UE may assume the CFI in CAS is given by this field. |
| ***systemFrameNumber***  Defines the 6 most significant bits of the SFN of the MBMS-dedicated cell. As indicated in TS 36.211 [21], clause 6.6.1, the 4 least significant bits of the SFN are acquired implicitly in the P-BCH decoding, i.e. timing of 160ms P-BCH TTI indicates 4 least significant bits (within 40ms P-BCH TTI, the first radio frame: 00, the fourth radio frame: 01, the eighth radio frame: 10, the last radio frame: 11). |

#### *– MBMSCountingRequest*

The *MBMSCountingRequest* message is used by E-UTRAN to count the UEs that are receiving or interested to receive specific MBMS services.

Signalling radio bearer: N/A

RLC-SAP: UM

Logical channel: MCCH

Direction: E‑UTRAN to UE

*MBMSCountingRequest message*

-- ASN1START

MBMSCountingRequest-r10 ::= SEQUENCE {

countingRequestList-r10 CountingRequestList-r10,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

CountingRequestList-r10 ::= SEQUENCE (SIZE (1..maxServiceCount)) OF CountingRequestInfo-r10

CountingRequestInfo-r10 ::= SEQUENCE {

tmgi-r10 TMGI-r9,

...

}

-- ASN1STOP

#### *– MBMSCountingResponse*

The *MBMSCountingResponse* message is used by the UE to respond to an *MBMSCountingRequest* message.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E‑UTRAN

*MBMSCountingResponse message*

-- ASN1START

MBMSCountingResponse-r10 ::= SEQUENCE {

criticalExtensions CHOICE {

c1 CHOICE {

countingResponse-r10 MBMSCountingResponse-r10-IEs,

spare3 NULL, spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

MBMSCountingResponse-r10-IEs ::= SEQUENCE {

mbsfn-AreaIndex-r10 INTEGER (0..maxMBSFN-Area-1) OPTIONAL,

countingResponseList-r10 CountingResponseList-r10 OPTIONAL,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

CountingResponseList-r10 ::= SEQUENCE (SIZE (1..maxServiceCount)) OF CountingResponseInfo-r10

CountingResponseInfo-r10 ::= SEQUENCE {

countingResponseService-r10 INTEGER (0..maxServiceCount-1),

...

}

-- ASN1STOP

| *MBMSCountingResponse* field descriptions |
| --- |
| ***countingResponseList***  List of MBMS services which the UE is receiving or interested to receive. Value 0 for field *countingResponseService* corresponds to the first entry in *countingRequestList* within *MBMSCountingRequest*, value 1 corresponds to the second entry in this list and so on. |
| ***mbsfn-AreaIndex***  Index of the entry in field *mbsfn-AreaInfoList* within *SystemInformationBlockType13*. Value 0 corresponds to the first entry in 1st *mbsfn-AreaInfoList* within *SystemInformationBlockType13*, value 1 corresponds to the second entry in the same list, or when no more entry are present within the same *mbsfn-AreaInfoList*, then the first entry in the subsequent *mbsfn-AreaInfoList* within the same *SystemInformationBlockType13* and so on. |

#### *– MBMSInterestIndication*

The *MBMSInterestIndication* message is used to inform E-UTRAN that the UE is receiving/ interested to receive or no longer receiving/ interested to receive MBMS via an MRB or SC-MRB including MBMS service(s) in receive only mode.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E‑UTRAN

*MBMSInterestIndication message*

-- ASN1START

MBMSInterestIndication-r11 ::= SEQUENCE {

criticalExtensions CHOICE {

c1 CHOICE {

interestIndication-r11 MBMSInterestIndication-r11-IEs,

spare3 NULL, spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

MBMSInterestIndication-r11-IEs ::= SEQUENCE {

mbms-FreqList-r11 CarrierFreqListMBMS-r11 OPTIONAL,

mbms-Priority-r11 ENUMERATED {true} OPTIONAL,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension MBMSInterestIndication-v1310-IEs OPTIONAL

}

MBMSInterestIndication-v1310-IEs ::= SEQUENCE {

mbms-Services-r13 MBMS-ServiceList-r13 OPTIONAL,

nonCriticalExtension MBMSInterestIndication-v1540-IEs OPTIONAL

}

MBMSInterestIndication-v1540-IEs ::= SEQUENCE {

mbms-ROM-InfoList-r15 SEQUENCE (SIZE(1..maxMBMS-ServiceListPerUE-r13)) OF MBMS-ROM-Info-r15 OPTIONAL,

nonCriticalExtension MBMSInterestIndication-v1610-IEs OPTIONAL

}

MBMSInterestIndication-v1610-IEs ::= SEQUENCE {

mbms-ROM-InfoList-r16 SEQUENCE (SIZE(1..maxMBMS-ServiceListPerUE-r13)) OF MBMS-ROM-Info-r16 OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

MBMS-ROM-Info-r15 ::= SEQUENCE {

mbms-ROM-Freq-r15 ARFCN-ValueEUTRA-r9,

mbms-ROM-SubcarrierSpacing-r15 ENUMERATED {kHz15, kHz7dot5, kHz1dot25},

mbms-Bandwidth-r15 ENUMERATED {n6, n15, n25, n50, n75, n100}

}

MBMS-ROM-Info-r16 ::= SEQUENCE {

mbms-ROM-Freq-r16 ARFCN-ValueEUTRA-r9,

mbms-ROM-SubcarrierSpacing-r16 ENUMERATED {kHz2dot5, kHz0dot37},

mbms-Bandwidth-r16 ENUMERATED {n6, n15, n25, n50, n75, n100}

}

-- ASN1STOP

| *MBMSInterestIndication* field descriptions |
| --- |
| ***mbms-Bandwidth***  Indicates the UE received MBMS service frequency bandwidth configuration, NRB in downlink, see TS 36.101 [42], table 5.6-1. n6 corresponds to 6 resource blocks, n15 to 15 resource blocks and so on. |
| ***mbms-FreqList***  List of MBMS frequencies on which the UE is receiving or interested to receive MBMS via an MRB or SC-MRB. |
| ***mbms-Priority***  Indicates whether the UE prioritises MBMS reception above unicast reception. The field is present (i.e. value *true*), if the UE prioritises reception of all listed MBMS frequencies above reception of any of the unicast bearers. Otherwise the field is absent. |
| ***mbms-ROM-Freq***  The value indicates the carrier frequency used by the UE to receive MBMS service(s) in receive only mode. |
| ***mbms-ROM-InfoList***  List of receive only mode MBMS service(s) related parameters which the UE is receiving or interested to receive. |
| ***mbms-ROM-SubcarrierSpacing***  The value indicates subcarrier spacing for MBSFN subframes received by UE in receive only mode and kHz15 refers to 15kHz, kHz7dot5 refers to 7.5kHz subcarrier spacing and so on as defined in TS 36.211 [21], clause 6.12. |

#### – *MBSFNAreaConfiguration*

The *MBSFNAreaConfiguration* message contains the MBMS control information applicable for an MBSFN area. For each MBSFN area included in *SystemInformationBlockType13* E-UTRAN configures an MCCH (i.e. the MCCH identifies the MBSFN area) and signals the *MBSFNAreaConfiguration* message.

Signalling radio bearer: N/A

RLC-SAP: UM

Logical channel: MCCH

Direction: E‑UTRAN to UE

*MBSFNAreaConfiguration message*

-- ASN1START

MBSFNAreaConfiguration-r9 ::= SEQUENCE {

commonSF-Alloc-r9 CommonSF-AllocPatternList-r9,

commonSF-AllocPeriod-r9 ENUMERATED {

rf4, rf8, rf16, rf32, rf64, rf128, rf256},

pmch-InfoList-r9 PMCH-InfoList-r9,

nonCriticalExtension MBSFNAreaConfiguration-v930-IEs OPTIONAL

}

MBSFNAreaConfiguration-v930-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension MBSFNAreaConfiguration-v1250-IEs OPTIONAL

}

MBSFNAreaConfiguration-v1250-IEs ::= SEQUENCE {

pmch-InfoListExt-r12 PMCH-InfoListExt-r12 OPTIONAL, -- Need OR

nonCriticalExtension MBSFNAreaConfiguration-v1430-IEs OPTIONAL

}

MBSFNAreaConfiguration-v1430-IEs ::= SEQUENCE {

commonSF-Alloc-v1430 CommonSF-AllocPatternList-v1430,

nonCriticalExtension MBSFNAreaConfiguration-v1610-IEs OPTIONAL

}

MBSFNAreaConfiguration-v1610-IEs ::= SEQUENCE {

commonSF-Alloc-v1610 CommonSF-AllocPatternList-v1610 OPTIONAL, -- Need OR

nonCriticalExtension SEQUENCE {} OPTIONAL

}

CommonSF-AllocPatternList-r9 ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF MBSFN-SubframeConfig

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

CommonSF-AllocPatternList-v1610 ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF MBSFN-SubframeConfig-v1610

-- ASN1STOP

| *MBSFNAreaConfiguration* field descriptions |
| --- |
| ***commonSF-Alloc***  Indicates the subframes allocated to the MBSFN area. E-UTRAN always sets this field to cover at least the subframes configured by *SystemInformationBlockType13* for this MCCH, regardless of whether any MBMS sessions are ongoing. E-UTRAN includes *commonSF-Alloc-v1610* only when the cell is a MBMS-dedicated cell. If E-UTRAN includes *commonSF-Alloc-v1430* and/or *commonSF-Alloc-v1610*, it includes the same number of entries, and listed in the same order, as in*commonSF-Alloc-r9*. |
| ***commonSF-AllocPeriod***  Indicates the period during which resources corresponding with field *commonSF-Alloc* are divided between the (P)MCH that are configured for this MBSFN area. The subframe allocation patterns, as defined by *commonSF-Alloc*, repeat continously during this period. Value rf4 corresponds to 4 radio frames, rf8 corresponds to 8 radio frames and so on. The *commonSF-AllocPeriod* starts in the radio frames for which: SFN mod *commonSF-AllocPeriod* = 0. |
| ***pmch-InfoList***  EUTRAN may include *pmch-InfoListExt* even if *pmch-InfoList* does not include *maxPMCH-PerMBSFN* entries. EUTRAN configures at most *maxPMCH-PerMBSFN* entries i.e. across *pmch-InfoList* and *pmch-InfoListExt*. |

#### – *MCGFailureInformation*

The *MCGFailureInformation* message is used to provide information regarding E-UTRA MCG failures detected by the UE.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E-UTRAN

*MCGFailureInformation* message

-- ASN1START

MCGFailureInformation-r16 ::= SEQUENCE {

criticalExtensions CHOICE {

mcgFailureInformation MCGFailureInformation-r16-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

MCGFailureInformation-r16-IEs ::= SEQUENCE {

failureReportMCG-r16 FailureReportMCG-r16 OPTIONAL,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

FailureReportMCG-r16 ::= SEQUENCE {

failureType-r16 ENUMERATED {

t310-Expiry, randomAccessProblem,

rlc-MaxNumRetx, t312-Expiry, spare4,

spare3, spare2, spare1} OPTIONAL,

measResultFreqListEUTRA-r16 MeasResultList3EUTRA-r15 OPTIONAL,

measResultFreqListNR-r16 MeasResultFreqListFailNR-r15 OPTIONAL,

measResultFreqListGERAN-r16 MeasResultList2GERAN-r10 OPTIONAL,

measResultFreqListUTRA-r16 MeasResultList2UTRA-r9 OPTIONAL,

measResultSCG-r16 OCTET STRING OPTIONAL,

...

}

-- ASN1STOP

| *MCGFailureInformation* field descriptions |
| --- |
| ***measResultFreqListEUTRA***  The field contains available results of measurements on EUTRA frequencies the UE is configured to measure by *measConfig*. |
| ***measResultFreqListGERAN***  The field contains available results of measurements on GERAN frequencies the UE is configured to measure by *measConfig*. |
| ***measResultFreqListNR***  The field contains available results of measurements on NR frequencies the UE is configured to measure by *measConfig*. |
| ***measResultFreqListUTRA***  The field contains available results of measurements on UTRA frequencies the UE is configured to measure by *measConfig*. |
| ***measResultSCG***  Includes the NR *MeasResultSCG-Failure* IE as specified in TS 38.331 [82]. The field contains available results of measurements on NR frequencies the UE is configured to measure by the NR RRCConfiguration message. |

#### *– MeasReportAppLayer*

The *MeasReportAppLayer* message is used for sending application layer measurement report.

Signalling radio bearer: SRB4

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E‑UTRAN

*MeasReportAppLayer* message

-- ASN1START

MeasReportAppLayer-r15 ::= SEQUENCE {

criticalExtensions CHOICE {

measReportAppLayer-r15 MeasReportAppLayer-r15-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

MeasReportAppLayer-r15-IEs ::= SEQUENCE {

measReportAppLayerContainer-r15 OCTET STRING (SIZE(1..8000)) OPTIONAL,

serviceType-r15 ENUMERATED {qoe, qoemtsi, spare6, spare5, spare4, spare3, spare2, spare1} OPTIONAL,

nonCriticalExtension MeasReportAppLayer-v1590-IEs OPTIONAL

}

MeasReportAppLayer-v1590-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

| *MeasReportAppLayer* field descriptions |
| --- |
| ***measReportAppLayerContainer***  The field contains container of application layer measurements, see Annex L (normative) in TS 26.247 [90] and clause 16.5 in TS 26.114 [99]. |
| ***serviceType***  Indicates the type of application layer measurement. Value qoe indicates Quality of Experience Measurement Collection for streaming services, value qoemtsi indicates Quality of Experience Measurement Collection for MTSI. |

#### – *MeasurementReport*

The *MeasurementReport* message is used for the indication of measurement results.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E‑UTRAN

*MeasurementReport message*

-- ASN1START

MeasurementReport ::= SEQUENCE {

criticalExtensions CHOICE {

c1 CHOICE{

measurementReport-r8 MeasurementReport-r8-IEs,

spare7 NULL,

spare6 NULL, spare5 NULL, spare4 NULL,

spare3 NULL, spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

MeasurementReport-r8-IEs ::= SEQUENCE {

measResults  MeasResults,

nonCriticalExtension MeasurementReport-v8a0-IEs OPTIONAL

}

MeasurementReport-v8a0-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

#### – *MobilityFromEUTRACommand*

The *MobilityFromEUTRACommand* message is used to command handover or a cell change from E‑UTRA to another RAT (3GPP or non-3GPP), or enhanced CS fallback to CDMA2000 1xRTT.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: E‑UTRAN to UE

*MobilityFromEUTRACommand message*

-- ASN1START

MobilityFromEUTRACommand ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

c1 CHOICE{

mobilityFromEUTRACommand-r8 MobilityFromEUTRACommand-r8-IEs,

mobilityFromEUTRACommand-r9 MobilityFromEUTRACommand-r9-IEs,

spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

MobilityFromEUTRACommand-r8-IEs ::= SEQUENCE {

cs-FallbackIndicator BOOLEAN,

purpose CHOICE{

handover Handover,

cellChangeOrder CellChangeOrder

},

nonCriticalExtension MobilityFromEUTRACommand-v8a0-IEs OPTIONAL

}

MobilityFromEUTRACommand-v8a0-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension MobilityFromEUTRACommand-v8d0-IEs OPTIONAL

}

MobilityFromEUTRACommand-v8d0-IEs ::= SEQUENCE {

bandIndicator BandIndicatorGERAN OPTIONAL, -- Cond GERAN

nonCriticalExtension SEQUENCE {} OPTIONAL

}

MobilityFromEUTRACommand-r9-IEs ::= SEQUENCE {

cs-FallbackIndicator BOOLEAN,

purpose CHOICE{

handover Handover,

cellChangeOrder CellChangeOrder,

e-CSFB-r9 E-CSFB-r9,

...

},

nonCriticalExtension MobilityFromEUTRACommand-v930-IEs OPTIONAL

}

MobilityFromEUTRACommand-v930-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension MobilityFromEUTRACommand-v960-IEs OPTIONAL

}

MobilityFromEUTRACommand-v960-IEs ::= SEQUENCE {

bandIndicator BandIndicatorGERAN OPTIONAL, -- Cond GERAN

nonCriticalExtension MobilityFromEUTRACommand-v1530-IEs OPTIONAL

}

MobilityFromEUTRACommand-v1530-IEs ::= SEQUENCE {

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

nonCriticalExtension SEQUENCE {} OPTIONAL

}

Handover ::= SEQUENCE {

targetRAT-Type ENUMERATED {

utra, geran, cdma2000-1XRTT, cdma2000-HRPD,

nr, eutra, spare2, spare1, ...},

targetRAT-MessageContainer OCTET STRING,

nas-SecurityParamFromEUTRA OCTET STRING (SIZE (1)) OPTIONAL, -- Cond UTRAGERANEPC

systemInformation SI-OrPSI-GERAN OPTIONAL -- Cond PSHO

}

CellChangeOrder ::= SEQUENCE {

t304 ENUMERATED {

ms100, ms200, ms500, ms1000,

ms2000, ms4000, ms8000, ms10000-v1310},

targetRAT-Type CHOICE {

geran SEQUENCE {

physCellId PhysCellIdGERAN,

carrierFreq CarrierFreqGERAN,

networkControlOrder BIT STRING (SIZE (2)) OPTIONAL, -- Need OP

systemInformation SI-OrPSI-GERAN OPTIONAL -- Need OP

},

...

}

}

SI-OrPSI-GERAN ::= CHOICE {

si SystemInfoListGERAN,

psi SystemInfoListGERAN

}

E-CSFB-r9 ::= SEQUENCE {

messageContCDMA2000-1XRTT-r9 OCTET STRING OPTIONAL, -- Need ON

mobilityCDMA2000-HRPD-r9 ENUMERATED {

handover, redirection

} OPTIONAL, -- Need OP

messageContCDMA2000-HRPD-r9 OCTET STRING OPTIONAL, -- Cond concHO

redirectCarrierCDMA2000-HRPD-r9 CarrierFreqCDMA2000 OPTIONAL -- Cond concRedir

}

-- ASN1STOP

| *MobilityFromEUTRACommand* field descriptions |
| --- |
| ***bandIndicator***  Indicates how to interpret the ARFCN of the BCCH carrier. |
| ***carrierFreq***  contains the carrier frequency of the target GERAN cell. |
| ***cs-FallbackIndicator***  Value *true* indicates that the CS fallback procedure to UTRAN or GERAN is triggered. |
| ***messageContCDMA2000-1XRTT***  This field contains a message specified in CDMA2000 1xRTT standard that either tells the UE to move to specific 1xRTT target cell(s) or indicates a failure to allocate resources for the enhanced CS fallback to CDMA2000 1xRTT. |
| ***messageContCDMA2000-HRPD***  This field contains a message specified in CDMA2000 HRPD standard that either tells the UE to move to specific HRPD target cell(s) or indicates a failure to allocate resources for the handover to CDMA2000 HRPD. |
| ***mobilityCDMA2000-HRPD***  This field indicates whether or not mobility to CDMA2000 HRPD is to be performed by the UE and it also indicates the type of mobility to CDMA2000 HRPD that is to be performed; If this field is not present the UE shall perform only the enhanced CS fallback to CDMA2000 1xRTT. |
| ***nas-SecurityParamFromEUTRA***  If the *targetRAT-Type* is set to "*eutra"* and the source CN is 5GC, this field is used to deliver the key synchronisation and key freshness for the Key freshness for the 5GS to EPS handovers as specified in TS 33.501 [86] and the content of the parameter is defined in TS 24.501 [95]. Otherwise, this field is used to deliver the key synchronisation and Key freshness for the E-UTRAN to UTRAN handovers as specified in TS 33.401 [32] and the content of the parameter is defined in TS24.301 [35]. |
| ***networkControlOrder***  Parameter NETWORK\_CONTROL\_ORDER in TS 44.060 [36]. |
| ***purpose***  Indicates which type of mobility procedure the UE is requested to perform. EUTRAN always applies value *e-CSFB* in case of enhanced CS fallback to CDMA2000 (e.g. also when that procedure results in handover to CDMA2000 1XRTT only, in handover to CDMA2000 HRPD only or in redirection to CDMA2000 HRPD only), |
| ***redirectCarrierCDMA2000-HRPD***  The *redirectCarrierCDMA2000-HRPD* indicates a CDMA2000 carrier frequency and is used to redirect the UE to a HRPD carrier frequency. |
| ***smtc***  The SSB periodicity/offset/duration configuration of target cell for inter-RAT handover to NR. It is based on timing reference of EUTRA PCell. If the field is absent, the UE uses the SMTC in the *measObjectNR* having the same SSB frequency and subcarrier spacing, as configured before the reception of the RRC message. |
| ***SystemInfoListGERAN***  If *purpose* = *CellChangeOrder* and if the field is not present, the UE has to acquire SI/PSI from the GERAN cell. |
| ***t304***  Timer T304 as described in clause 7.3. Value ms100 corresponds with 100 ms, ms200 corresponds with 200 ms and so on. EUTRAN includes extended value *ms10000-v1310* only when UE supports CE. |
| ***targetRAT-Type***  Indicates the target RAT type. |
| ***targetRAT-MessageContainer***  The field contains a message specified in another standard, as indicated by the *targetRAT-Type*, and carries information about the target cell identifier(s) and radio parameters relevant for the target radio access technology. NOTE 1.  A complete message is included, as specified in the other standard. |

| Conditional presence | Explanation |
| --- | --- |
| *concHO* | The field is mandatory present if the *mobilityCDMA2000-HRPD* is set to "*handover*"; otherwise the field is optional present, need ON. |
| *concRedir* | The field is mandatory present if the m*obilityCDMA2000-HRPD* is set to "*redirection*"; otherwise the field is not present. |
| *GERAN* | The field should be present if the *purpose* is set to "*handover*" and the *targetRAT-Type* is set to "*geran*"; otherwise the field is not present |
| *PSHO* | The field is mandatory present in case of PS handover toward GERAN; otherwise the field is optionally present, but not used by the UE |
| *UTRAGERANEPC* | The field is mandatory present if the *targetRAT-Type* is set to "*utra*" or "*geran*" or if the *targetRAT-Type* is set to "*eutra*" and the source CN is 5GC; otherwise the field is not present |

NOTE 1: The correspondence between the value of the *targetRAT-Type*, the standard to apply and the message contained within the *targetRAT-MessageContainer* is shown in the table below:

|  |  |  |
| --- | --- | --- |
| targetRAT-Type | Standard to apply | targetRAT-MessageContainer |
| *cdma2000-1XRTT* | C.S0001 or later, C.S0007 or later, C.S0008 or later |  |
| *cdma2000-HRPD* | C.S0024 or later |  |
| *eutra* | TS 36.331 (clause 5.4.2) | *RRCConnectionReconfiguration* | |
| *geran* | GSM TS 04.18, version 8.5.0 or later, or TS 44.018 (clause 9.1.15)  TS 44.060, version 6.13.0 or later (clause 11.2.43)  TS 44.060, version 7.6.0 or later (clause 11.2.46) | HANDOVER COMMAND  PS HANDOVER COMMAND  DTM HANDOVER COMMAND |
| *nr* | TS 38.331 (clause 6.2.2) | RRCReconfiguration |
| *utra* | TS 25.331 (clause 10.2.16a) | Handover TO UTRAN command |

#### – *Paging*

The *Paging* message is used for the notification of one or more UEs.

Signalling radio bearer: N/A

RLC-SAP: TM

Logical channel: PCCH

Direction: E‑UTRAN to UE

*Paging* message

-- ASN1START

Paging ::= SEQUENCE {

pagingRecordList PagingRecordList OPTIONAL, -- Need ON

systemInfoModification ENUMERATED {true} OPTIONAL, -- Need ON

etws-Indication ENUMERATED {true} OPTIONAL, -- Need ON

nonCriticalExtension Paging-v890-IEs OPTIONAL

}

Paging-v890-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension Paging-v920-IEs OPTIONAL

}

Paging-v920-IEs ::= SEQUENCE {

cmas-Indication-r9 ENUMERATED {true} OPTIONAL, -- Need ON

nonCriticalExtension Paging-v1130-IEs OPTIONAL

}

Paging-v1130-IEs ::= SEQUENCE {

eab-ParamModification-r11 ENUMERATED {true} OPTIONAL, -- Need ON

nonCriticalExtension Paging-v1310-IEs OPTIONAL

}

Paging-v1310-IEs ::= SEQUENCE {

redistributionIndication-r13 ENUMERATED {true} OPTIONAL, -- Need ON

systemInfoModification-eDRX-r13 ENUMERATED {true} OPTIONAL, -- Need ON

nonCriticalExtension Paging-v1530-IEs OPTIONAL

}

Paging-v1530-IEs ::= SEQUENCE {

accessType ENUMERATED {non3GPP} OPTIONAL, -- Need ON

nonCriticalExtension Paging-v1610-IEs OPTIONAL

}

Paging-v1610-IEs ::= SEQUENCE {

pagingRecordList-v1610 PagingRecordList-v1610 OPTIONAL, -- Need ON

uac-ParamModification-r16 ENUMERATED {true} OPTIONAL, -- Need ON

nonCriticalExtension Paging-v1700-IEs OPTIONAL

}

Paging-v1700-IEs ::= SEQUENCE {

pagingRecordList-v1700 PagingRecordList-v1700 OPTIONAL, -- Need ON

nonCriticalExtension SEQUENCE {} OPTIONAL

}

PagingRecordList ::= SEQUENCE (SIZE (1..maxPageRec)) OF PagingRecord

PagingRecordList-v1610 ::= SEQUENCE (SIZE (1..maxPageRec)) OF PagingRecord-v1610

PagingRecordList-v1700 ::= SEQUENCE (SIZE (1..maxPageRec)) OF PagingRecord-v1700

PagingRecord ::= SEQUENCE {

ue-Identity PagingUE-Identity,

cn-Domain ENUMERATED {ps, cs},

...

}

PagingRecord-v1610 ::= SEQUENCE {

accessType-r16 ENUMERATED {non3GPP} OPTIONAL, -- Need ON

mt-EDT-r16 ENUMERATED {true} OPTIONAL -- Need ON

}

PagingRecord-v1700 ::= SEQUENCE {

pagingCause-r17 ENUMERATED {voice} OPTIONAL -- Need ON

}

PagingUE-Identity ::= CHOICE {

s-TMSI S-TMSI,

imsi IMSI,

...,

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

fullI-RNTI-r15 I-RNTI-r15

}

IMSI ::= SEQUENCE (SIZE (6..21)) OF IMSI-Digit

IMSI-Digit ::= INTEGER (0..9)

-- ASN1STOP

| *Paging* field descriptions |
| --- |
| ***accessType***  It indicates whether Paging is originated due to the PDU sessions from the non-3GPP access when E-UTRA is connected to 5GC. E-UTRAN does not include both *accessType* (i.e., without suffix) and *accessType-r16* in a single paging message. |
| ***cmas-Indication***  If present: indication of a CMAS notification. |
| ***cn-Domain***  Indicates the origin of paging. |
| ***eab-ParamModification***  If present: indication of an EAB parameters (SIB14) modification. |
| ***etws-Indication***  If present: indication of an ETWS primary notification and/ or ETWS secondary notification. |
| ***imsi***  The International Mobile Subscriber Identity, a globally unique permanent subscriber identity, see TS 23.003 [27]. The first element contains the first IMSI digit, the second element contains the second IMSI digit and so on. |
| ***mt-EDT***  Indication of mobile terminating EDT. |
| ***pagingCause***  Indicates whether the *Paging* message is originated due to IMS voice. If the field is present and upper layers indicate the support of paging cause, it implies that the corresponding paging entry is for IMS voice. If this field is not present but *pagingRecordList-v1700* is present, it implies that the corresponding paging entry is for a service other than IMS voice. Otherwise, *pagingCause* is undetermined. |
| ***pagingRecordList***  If E-UTRAN includes *pagingRecordList-v1610* and/or *pagingRecordList-v1700*,it includes the same number of entries, and listed in the same order, as in *pagingRecordList* (i.e. without suffix). |
| ***redistributionIndication***  If present: indication to trigger E-UTRAN inter-frequency redistribution procedure as specified in TS 36.304 [4], clause 5.2.4.10. |
| ***systemInfoModification***  If present: indication of a BCCH modification other than SIB10, SIB11, SIB12, SIB14 and SIB31. This indication does not apply to UEs using eDRX cycle longer than the BCCH modification period. |
| ***systemInfoModification-eDRX***  If present: indication of a BCCH modification other than SIB10, SIB11, SIB12, SIB14 and SIB31. This indication applies only to UEs using eDRX cycle longer than the BCCH modification period. |
| ***uac-ParamModification***  If present: indication of UAC parameters (SIB25) modification. | |
| ***ue-Identity***  Provides the NAS identity of the UE that is being paged. The IMSI is not applicable for E-UTRA/5GC. |

#### – *ProximityIndication*

The *ProximityIndication* message is used to indicate that the UE is entering or leaving the proximity of one or more CSG member cell(s).

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E‑UTRAN

*ProximityIndication message*

-- ASN1START

ProximityIndication-r9 ::= SEQUENCE {

criticalExtensions CHOICE {

c1 CHOICE {

proximityIndication-r9 ProximityIndication-r9-IEs,

spare3 NULL, spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

ProximityIndication-r9-IEs ::= SEQUENCE {

type-r9 ENUMERATED {entering, leaving},

carrierFreq-r9 CHOICE {

eutra-r9 ARFCN-ValueEUTRA,

utra-r9 ARFCN-ValueUTRA,

...,

eutra2-v9e0 ARFCN-ValueEUTRA-v9e0

},

nonCriticalExtension ProximityIndication-v930-IEs OPTIONAL

}

ProximityIndication-v930-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

| *ProximityIndication* field descriptions |
| --- |
| ***carrierFreq***  Indicates the RAT and frequency of the CSG member cell(s), for which the proximity indication is sent. For E-UTRA and UTRA frequencies, the UE shall set the ARFCN according to a band it previously considered suitable for accessing (one of) the CSG member cell(s), for which the proximity indication is sent. |
| ***type***  Used to indicate whether the UE is entering or leaving the proximity of CSG member cell(s). |

#### *– 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},

requestedPeriodicityAndOffset-r16 PUR-PeriodicityAndOffset-r16 OPTIONAL,

requestedTBS-r16 ENUMERATED {b328, b344, b376, b392, b408,

b424, b440, b456, b472, b488, b504, b536,

b568, b584, b616, b648, b680, b712, b744,

b776, b808, b840, b872, b904, b936, b968,

b1000, b1032, b1064, b1096, b1128, b1160,

b1192, b1224, b1256, b1288, b1320, b1352,

b1384, b1416, b1480, b1544, b1608, b1672,

b1736, b1800, b1864, b1928, b1992, b2024,

b2088, b2152, b2216, b2280, b2344, b2408,

b2472, b2536, b2600, b2664, b2728, b2792,

b2856, b2984},

rrc-ACK-r16 ENUMERATED {true} 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. |
| ***requestedPeriodicityAndOffset***  Indicates the requested periodicity for the PUR occasions and time offset until the first PUR occasion. |
| ***requestedTBS***  Indicates the requested TBS for the PUR. *b328* corresponds to 328 bits, *b344* corresponds to 344 bits and so on. The maximum requested TBS is limited to the UL TBS size supported by the UE. |
| ***rrc-ACK***  Indicates RRC response message is preferred by the UE for acknowledging the reception of a transmission using PUR. |

#### *– RNReconfiguration*

The *RNReconfiguration* is a command to modify the RN subframe configuration and/or to convey changed system information.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: E‑UTRAN to RN

RNReconfiguration message

-- ASN1START

RNReconfiguration-r10 ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

c1 CHOICE {

rnReconfiguration-r10 RNReconfiguration-r10-IEs,

spare3 NULL, spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

RNReconfiguration-r10-IEs ::= SEQUENCE {

rn-SystemInfo-r10 RN-SystemInfo-r10 OPTIONAL, -- Need ON

rn-SubframeConfig-r10 RN-SubframeConfig-r10 OPTIONAL, -- Need ON

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

RN-SystemInfo-r10 ::= SEQUENCE {

systemInformationBlockType1-r10 OCTET STRING (CONTAINING SystemInformationBlockType1) OPTIONAL, -- Need ON

systemInformationBlockType2-r10 SystemInformationBlockType2 OPTIONAL, -- Need ON

...

}

-- ASN1STOP

#### *– RNReconfigurationComplete*

The *RNReconfigurationComplete* message is used to confirm the successful completion of an RN reconfiguration.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: RN to E-UTRAN

*RNReconfigurationComplete message*

-- ASN1START

RNReconfigurationComplete-r10 ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

c1 CHOICE{

rnReconfigurationComplete-r10 RNReconfigurationComplete-r10-IEs,

spare3 NULL, spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

RNReconfigurationComplete-r10-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

#### – *RRCConnectionReconfiguration*

The *RRCConnectionReconfiguration* message is the command to modify an RRC connection. It may convey information for measurement configuration, mobility control, conditional reconfigurations (conditional handover, conditional PSCell addition or inter-SN conditional PSCell change), radio resource configuration (including RBs, MAC main configuration and physical channel configuration) including any associated dedicated NAS information and security configuration.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: E‑UTRAN to UE

*RRCConnectionReconfiguration message*

-- ASN1START

RRCConnectionReconfiguration ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

c1 CHOICE{

rrcConnectionReconfiguration-r8 RRCConnectionReconfiguration-r8-IEs,

spare7 NULL,

spare6 NULL, spare5 NULL, spare4 NULL,

spare3 NULL, spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

RRCConnectionReconfiguration-r8-IEs ::= SEQUENCE {

measConfig MeasConfig OPTIONAL, -- Need ON

mobilityControlInfo MobilityControlInfo OPTIONAL, -- Cond HO

dedicatedInfoNASList SEQUENCE (SIZE(1..maxDRB)) OF

DedicatedInfoNAS OPTIONAL, -- Cond nonHO

radioResourceConfigDedicated RadioResourceConfigDedicated OPTIONAL, -- Cond HO-toEUTRA

securityConfigHO SecurityConfigHO OPTIONAL, -- Cond HO-toEPC

nonCriticalExtension RRCConnectionReconfiguration-v890-IEs OPTIONAL

}

RRCConnectionReconfiguration-v890-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING (CONTAINING RRCConnectionReconfiguration-v8m0-IEs) OPTIONAL,

nonCriticalExtension RRCConnectionReconfiguration-v920-IEs OPTIONAL

}

-- Late non-critical extensions:

RRCConnectionReconfiguration-v8m0-IEs ::= SEQUENCE {

-- Following field is only for pre REL-10 late non-critical extensions

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension RRCConnectionReconfiguration-v10i0-IEs OPTIONAL

}

RRCConnectionReconfiguration-v10i0-IEs ::= SEQUENCE {

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

nonCriticalExtension RRCConnectionReconfiguration-v10l0-IEs OPTIONAL

}

RRCConnectionReconfiguration-v10l0-IEs ::= SEQUENCE {

mobilityControlInfo-v10l0 MobilityControlInfo-v10l0 OPTIONAL,

sCellToAddModList-v10l0 SCellToAddModList-v10l0 OPTIONAL, -- Need ON

-- Following field is only for late non-critical extensions from REL-10 to REL-11

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension RRCConnectionReconfiguration-v12f0-IEs OPTIONAL

}

RRCConnectionReconfiguration-v12f0-IEs ::= SEQUENCE {

scg-Configuration-v12f0 SCG-Configuration-v12f0 OPTIONAL, -- Cond nonFullConfig

-- Following field is only for late non-critical extensions from REL-12

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension RRCConnectionReconfiguration-v1370-IEs OPTIONAL

}

RRCConnectionReconfiguration-v1370-IEs ::= SEQUENCE {

radioResourceConfigDedicated-v1370 RadioResourceConfigDedicated-v1370 OPTIONAL, -- Need ON

sCellToAddModListExt-v1370 SCellToAddModListExt-v1370 OPTIONAL, -- Need ON

nonCriticalExtension RRCConnectionReconfiguration-v13c0-IEs OPTIONAL

}

RRCConnectionReconfiguration-v13c0-IEs ::= SEQUENCE {

radioResourceConfigDedicated-v13c0 RadioResourceConfigDedicated-v13c0 OPTIONAL, -- Need ON

sCellToAddModList-v13c0 SCellToAddModList-v13c0 OPTIONAL, -- Need ON

sCellToAddModListExt-v13c0 SCellToAddModListExt-v13c0 OPTIONAL, -- Need ON

scg-Configuration-v13c0 SCG-Configuration-v13c0 OPTIONAL, -- Need ON

-- Following field is only for late non-critical extensions from REL-13 onwards

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- Regular non-critical extensions:

RRCConnectionReconfiguration-v920-IEs ::= SEQUENCE {

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

fullConfig-r9 ENUMERATED {true} OPTIONAL, -- Cond HO-Reestab

nonCriticalExtension RRCConnectionReconfiguration-v1020-IEs OPTIONAL

}

RRCConnectionReconfiguration-v1020-IEs ::= SEQUENCE {

sCellToReleaseList-r10 SCellToReleaseList-r10 OPTIONAL, -- Need ON

sCellToAddModList-r10 SCellToAddModList-r10 OPTIONAL, -- Need ON

nonCriticalExtension RRCConnectionReconfiguration-v1130-IEs OPTIONAL

}

RRCConnectionReconfiguration-v1130-IEs ::= SEQUENCE {

systemInformationBlockType1Dedicated-r11 OCTET STRING (CONTAINING SystemInformationBlockType1) OPTIONAL, -- Need ON

nonCriticalExtension RRCConnectionReconfiguration-v1250-IEs OPTIONAL

}

RRCConnectionReconfiguration-v1250-IEs ::= SEQUENCE {

wlan-OffloadInfo-r12 CHOICE {

release NULL,

setup SEQUENCE {

wlan-OffloadConfigDedicated-r12 WLAN-OffloadConfig-r12,

t350-r12 ENUMERATED {min5, min10, min20, min30, min60,

min120, min180, spare1} OPTIONAL -- Need OR

}

} OPTIONAL, -- Need ON

scg-Configuration-r12 SCG-Configuration-r12 OPTIONAL, -- Cond nonFullConfig

sl-SyncTxControl-r12 SL-SyncTxControl-r12 OPTIONAL, -- Need ON

sl-DiscConfig-r12 SL-DiscConfig-r12 OPTIONAL, -- Need ON

sl-CommConfig-r12 SL-CommConfig-r12 OPTIONAL, -- Need ON

nonCriticalExtension RRCConnectionReconfiguration-v1310-IEs OPTIONAL

}

RRCConnectionReconfiguration-v1310-IEs ::= SEQUENCE {

sCellToReleaseListExt-r13 SCellToReleaseListExt-r13 OPTIONAL, -- Need ON

sCellToAddModListExt-r13 SCellToAddModListExt-r13 OPTIONAL, -- Need ON

lwa-Configuration-r13 LWA-Configuration-r13 OPTIONAL, -- Need ON

lwip-Configuration-r13 LWIP-Configuration-r13 OPTIONAL, -- Need ON

rclwi-Configuration-r13 RCLWI-Configuration-r13 OPTIONAL, -- Need ON

nonCriticalExtension RRCConnectionReconfiguration-v1430-IEs OPTIONAL

}

RRCConnectionReconfiguration-v1430-IEs ::= SEQUENCE {

sl-V2X-ConfigDedicated-r14 SL-V2X-ConfigDedicated-r14 OPTIONAL, -- Need ON

sCellToAddModListExt-v1430 SCellToAddModListExt-v1430 OPTIONAL, -- Need ON

perCC-GapIndicationRequest-r14 ENUMERATED{true} OPTIONAL, -- Need ON

systemInformationBlockType2Dedicated-r14 OCTET STRING (CONTAINING SystemInformationBlockType2) OPTIONAL, -- Cond nonHO

nonCriticalExtension RRCConnectionReconfiguration-v1510-IEs OPTIONAL

}

RRCConnectionReconfiguration-v1510-IEs ::= SEQUENCE {

nr-Config-r15 CHOICE {

release NULL,

setup SEQUENCE {

endc-ReleaseAndAdd-r15 BOOLEAN,

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

p-MaxEUTRA-r15 P-Max OPTIONAL -- Need ON

}

} OPTIONAL, -- Need ON

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

tdm-PatternConfig-r15 TDM-PatternConfig-r15 OPTIONAL, -- Cond FDD-PCell

nonCriticalExtension RRCConnectionReconfiguration-v1530-IEs OPTIONAL

}

RRCConnectionReconfiguration-v1530-IEs ::= SEQUENCE {

securityConfigHO-v1530 SecurityConfigHO-v1530 OPTIONAL, -- Cond HO-5GC

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

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

dedicatedInfoNASList-r15 SEQUENCE (SIZE(1..maxDRB-r15)) OF

DedicatedInfoNAS OPTIONAL, -- Cond nonHO

p-MaxUE-FR1-r15 P-Max OPTIONAL, -- Need OR

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

nonCriticalExtension RRCConnectionReconfiguration-v1610-IEs OPTIONAL

}

RRCConnectionReconfiguration-v1610-IEs ::= SEQUENCE {

conditionalReconfiguration-r16 ConditionalReconfiguration-r16 OPTIONAL, -- Need ON

daps-SourceRelease-r16 ENUMERATED{true} OPTIONAL, -- Need ON

tdm-PatternConfig2-r16 TDM-PatternConfig-r15 OPTIONAL, -- Need ON

sl-ConfigDedicatedForNR-r16 OCTET STRING OPTIONAL, -- Need OR

sl-SSB-PriorityEUTRA-r16 INTEGER (1..8) OPTIONAL, -- Need OR

nonCriticalExtension RRCConnectionReconfiguration-v1700-IEs OPTIONAL

}

RRCConnectionReconfiguration-v1700-IEs ::= SEQUENCE {

systemInformationBlockType31Dedicated-r17 OCTET STRING (CONTAINING SystemInformationBlockType31-r17) OPTIONAL, -- Cond NTN

scg-State-r17 ENUMERATED{deactivated} OPTIONAL, -- Need OP

nonCriticalExtension SEQUENCE {} OPTIONAL

}

SL-SyncTxControl-r12 ::= SEQUENCE {

networkControlledSyncTx-r12 ENUMERATED {on, off} OPTIONAL -- Need OP

}

PSCellToAddMod-r12 ::= SEQUENCE {

sCellIndex-r12 SCellIndex-r10,

cellIdentification-r12 SEQUENCE {

physCellId-r12 PhysCellId,

dl-CarrierFreq-r12 ARFCN-ValueEUTRA-r9

} OPTIONAL, -- Cond SCellAdd

radioResourceConfigCommonPSCell-r12 RadioResourceConfigCommonPSCell-r12 OPTIONAL, -- Cond SCellAdd

radioResourceConfigDedicatedPSCell-r12 RadioResourceConfigDedicatedPSCell-r12 OPTIONAL, -- Cond SCellAdd2

...,

[[ antennaInfoDedicatedPSCell-v1280 AntennaInfoDedicated-v10i0 OPTIONAL -- Need ON

]],

[[ sCellIndex-r13 SCellIndex-r13 OPTIONAL -- Need ON

]],

[[ radioResourceConfigDedicatedPSCell-v1370 RadioResourceConfigDedicatedPSCell-v1370 OPTIONAL -- Need ON

]],

[[ radioResourceConfigDedicatedPSCell-v13c0 RadioResourceConfigDedicatedPSCell-v13c0 OPTIONAL -- Need ON

]]

}

PSCellToAddMod-v12f0 ::= SEQUENCE {

radioResourceConfigCommonPSCell-r12 RadioResourceConfigCommonPSCell-v12f0 OPTIONAL

}

PSCellToAddMod-v1440 ::= SEQUENCE {

radioResourceConfigCommonPSCell-r14 RadioResourceConfigCommonPSCell-v1440 OPTIONAL

}

PowerCoordinationInfo-r12 ::= SEQUENCE {

p-MeNB-r12 INTEGER (1..16),

p-SeNB-r12 INTEGER (1..16),

powerControlMode-r12 INTEGER (1..2)

}

SCellToAddModList-r10 ::= SEQUENCE (SIZE (1..maxSCell-r10)) OF SCellToAddMod-r10

SCellToAddModList-v10l0 ::= SEQUENCE (SIZE (1..maxSCell-r10)) OF SCellToAddMod-v10l0

SCellToAddModList-v13c0 ::= SEQUENCE (SIZE (1..maxSCell-r10)) OF SCellToAddMod-v13c0

SCellToAddModList-r16 ::= SEQUENCE (SIZE (1..maxSCell-r13)) OF SCellToAddMod-r16

SCellToAddModListExt-r13 ::= SEQUENCE (SIZE (1..maxSCell-r13)) OF SCellToAddModExt-r13

SCellToAddModListExt-v1370 ::= SEQUENCE (SIZE (1..maxSCell-r13)) OF SCellToAddModExt-v1370

SCellToAddModListExt-v13c0 ::= SEQUENCE (SIZE (1..maxSCell-r13)) OF SCellToAddMod-v13c0

SCellToAddModListExt-v1430 ::= SEQUENCE (SIZE (1..maxSCell-r13)) OF SCellToAddModExt-v1430

SCellGroupToAddModList-r15 ::= SEQUENCE (SIZE (1..maxSCellGroups-r15)) OF SCellGroupToAddMod-r15

SCellToAddMod-r10 ::= SEQUENCE {

sCellIndex-r10 SCellIndex-r10,

cellIdentification-r10 SEQUENCE {

physCellId-r10 PhysCellId,

dl-CarrierFreq-r10 ARFCN-ValueEUTRA

} OPTIONAL, -- Cond SCellAdd

radioResourceConfigCommonSCell-r10 RadioResourceConfigCommonSCell-r10 OPTIONAL, -- Cond SCellAdd

radioResourceConfigDedicatedSCell-r10 RadioResourceConfigDedicatedSCell-r10 OPTIONAL, -- Cond SCellAdd2

...,

[[ dl-CarrierFreq-v1090 ARFCN-ValueEUTRA-v9e0 OPTIONAL -- Cond EARFCN-max

]],

[[ antennaInfoDedicatedSCell-v10i0 AntennaInfoDedicated-v10i0 OPTIONAL -- Need ON

]],

[[ srs-SwitchFromServCellIndex-r14 INTEGER (0.. 31) OPTIONAL -- Need ON

]],

[[ sCellState-r15 ENUMERATED {activated, dormant} OPTIONAL -- Need ON

]]

}

SCellToAddMod-v10l0 ::= SEQUENCE {

radioResourceConfigCommonSCell-v10l0 RadioResourceConfigCommonSCell-v10l0 OPTIONAL

}

SCellToAddMod-v13c0 ::= SEQUENCE {

radioResourceConfigDedicatedSCell-v13c0 RadioResourceConfigDedicatedSCell-v13c0 OPTIONAL

}

SCellToAddMod-r16 ::= SEQUENCE {

sCellIndex-r16 SCellIndex-r13,

cellIdentification-r16 SEQUENCE {

physCellId-r16 PhysCellId,

dl-CarrierFreq-r16 ARFCN-ValueEUTRA-r9

} OPTIONAL, -- Cond SCellAdd

radioResourceConfigCommonSCell-r16 RadioResourceConfigCommonSCell-r10 OPTIONAL, -- Cond SCellAdd

radioResourceConfigDedicatedSCell-r16 RadioResourceConfigDedicatedSCell-r10 OPTIONAL, -- Cond SCellAdd2

antennaInfoDedicatedSCell-r16 AntennaInfoDedicated-v10i0 OPTIONAL, -- Need ON

srs-SwitchFromServCellIndex-r16 INTEGER (0.. 31) OPTIONAL, -- Need ON

sCellState-r16 ENUMERATED {activated, dormant} OPTIONAL, -- Need ON

...

}

SCellToAddModExt-r13 ::= SEQUENCE {

sCellIndex-r13 SCellIndex-r13,

cellIdentification-r13 SEQUENCE {

physCellId-r13 PhysCellId,

dl-CarrierFreq-r13 ARFCN-ValueEUTRA-r9

} OPTIONAL, -- Cond SCellAdd

radioResourceConfigCommonSCell-r13 RadioResourceConfigCommonSCell-r10 OPTIONAL, -- Cond SCellAdd

radioResourceConfigDedicatedSCell-r13 RadioResourceConfigDedicatedSCell-r10 OPTIONAL, -- Cond SCellAdd2

antennaInfoDedicatedSCell-r13 AntennaInfoDedicated-v10i0 OPTIONAL -- Need ON

}

SCellToAddModExt-v1370 ::= SEQUENCE {

radioResourceConfigCommonSCell-v1370 RadioResourceConfigCommonSCell-v10l0 OPTIONAL

}

SCellToAddModExt-v1430 ::= SEQUENCE {

srs-SwitchFromServCellIndex-r14 INTEGER (0.. 31) OPTIONAL, -- Need ON

...,

[[ sCellState-r15 ENUMERATED {activated, dormant} OPTIONAL -- Need ON

]]

}

SCellGroupToAddMod-r15 ::= SEQUENCE {

sCellGroupIndex-r15 SCellGroupIndex-r15,

sCellConfigCommon-r15 SCellConfigCommon-r15 OPTIONAL, -- Need ON

sCellToReleaseList-r15 SCellToReleaseListExt-r13 OPTIONAL, -- Need ON

sCellToAddModList-r15 SCellToAddModListExt-r13 OPTIONAL -- Need ON

}

SCellToReleaseList-r10 ::= SEQUENCE (SIZE (1..maxSCell-r10)) OF SCellIndex-r10

SCellToReleaseListExt-r13 ::= SEQUENCE (SIZE (1..maxSCell-r13)) OF SCellIndex-r13

SCellGroupToReleaseList-r15 ::= SEQUENCE (SIZE (1..maxSCellGroups-r15)) OF SCellGroupIndex-r15

SCellGroupIndex-r15 ::= INTEGER (1..maxSCellGroups-r15)

SCellConfigCommon-r15 ::= SEQUENCE {

radioResourceConfigCommonSCell-r15 RadioResourceConfigCommonSCell-r10 OPTIONAL, -- Need ON

radioResourceConfigDedicatedSCell-r15 RadioResourceConfigDedicatedSCell-r10 OPTIONAL,-- Need ON

antennaInfoDedicatedSCell-r15 AntennaInfoDedicated-v10i0 OPTIONAL -- Need ON

}

SCG-Configuration-r12 ::= CHOICE {

release NULL,

setup SEQUENCE {

scg-ConfigPartMCG-r12 SEQUENCE {

scg-Counter-r12 INTEGER (0.. 65535) OPTIONAL, -- Need ON

powerCoordinationInfo-r12 PowerCoordinationInfo-r12 OPTIONAL, -- Need ON

...

} OPTIONAL, -- Need ON

scg-ConfigPartSCG-r12 SCG-ConfigPartSCG-r12 OPTIONAL -- Need ON

}

}

SCG-Configuration-v12f0 ::= CHOICE {

release NULL,

setup SEQUENCE {

scg-ConfigPartSCG-v12f0 SCG-ConfigPartSCG-v12f0 OPTIONAL -- Need ON

}

}

SCG-Configuration-v13c0 ::= CHOICE {

release NULL,

setup SEQUENCE {

scg-ConfigPartSCG-v13c0 SCG-ConfigPartSCG-v13c0 OPTIONAL -- Need ON

}

}

SCG-ConfigPartSCG-r12 ::= SEQUENCE {

radioResourceConfigDedicatedSCG-r12 RadioResourceConfigDedicatedSCG-r12 OPTIONAL, -- Need ON

sCellToReleaseListSCG-r12 SCellToReleaseList-r10 OPTIONAL, -- Need ON

pSCellToAddMod-r12 PSCellToAddMod-r12 OPTIONAL, -- Need ON

sCellToAddModListSCG-r12 SCellToAddModList-r10 OPTIONAL, -- Need ON

mobilityControlInfoSCG-r12 MobilityControlInfoSCG-r12 OPTIONAL, -- Need ON

...,

[[

sCellToReleaseListSCG-Ext-r13 SCellToReleaseListExt-r13 OPTIONAL, -- Need ON

sCellToAddModListSCG-Ext-r13 SCellToAddModListExt-r13 OPTIONAL -- Need ON

]],

[[

sCellToAddModListSCG-Ext-v1370 SCellToAddModListExt-v1370 OPTIONAL -- Need ON

]],

[[

pSCellToAddMod-v1440 PSCellToAddMod-v1440 OPTIONAL -- Need ON

]],

[[ sCellGroupToReleaseListSCG-r15 SCellGroupToReleaseList-r15 OPTIONAL, -- Need ON

sCellGroupToAddModListSCG-r15 SCellGroupToAddModList-r15 OPTIONAL -- Need ON

]],

[[ -- NE-DC addition for setup/ modification and release SN configured measurements

measConfigSN-r15 MeasConfig OPTIONAL, -- Need ON

-- NE-DC additions concerning DRBs/ SRBs are within RadioResourceConfigDedicatedSCG

tdm-PatternConfigNE-DC-r15 TDM-PatternConfig-r15 OPTIONAL -- Cond FDD-PSCell

]],

[[ p-MaxEUTRA-r15 P-Max OPTIONAL -- Need ON

]]

}

SCG-ConfigPartSCG-v12f0 ::= SEQUENCE {

pSCellToAddMod-v12f0 PSCellToAddMod-v12f0 OPTIONAL, -- Need ON

sCellToAddModListSCG-v12f0 SCellToAddModList-v10l0 OPTIONAL -- Need ON

}

SCG-ConfigPartSCG-v13c0 ::= SEQUENCE {

sCellToAddModListSCG-v13c0 SCellToAddModList-v13c0 OPTIONAL, -- Need ON

sCellToAddModListSCG-Ext-v13c0 SCellToAddModListExt-v13c0 OPTIONAL -- Need ON

}

SecurityConfigHO ::= SEQUENCE {

handoverType CHOICE {

intraLTE SEQUENCE {

securityAlgorithmConfig SecurityAlgorithmConfig OPTIONAL, -- Cond fullConfig

keyChangeIndicator BOOLEAN,

nextHopChainingCount NextHopChainingCount

},

interRAT SEQUENCE {

securityAlgorithmConfig SecurityAlgorithmConfig,

nas-SecurityParamToEUTRA OCTET STRING (SIZE(6))

}

},

...

}

SecurityConfigHO-v1530 ::= SEQUENCE {

handoverType-v1530 CHOICE {

intra5GC-r15 SEQUENCE {

securityAlgorithmConfig-r15 SecurityAlgorithmConfig OPTIONAL, -- Cond HO-toEUTRA

keyChangeIndicator-r15 BOOLEAN,

nextHopChainingCount-r15 NextHopChainingCount,

nas-Container-r15 OCTET STRING OPTIONAL -- Need ON

},

fivegc-ToEPC-r15 SEQUENCE {

securityAlgorithmConfig-r15 SecurityAlgorithmConfig,

nextHopChainingCount-r15 NextHopChainingCount

},

epc-To5GC-r15 SEQUENCE {

securityAlgorithmConfig-r15 SecurityAlgorithmConfig,

nas-Container-r15 OCTET STRING

}

},

...

}

-- ASN1STOP

| *RRCConnectionReconfiguration* field descriptions |
| --- |
| ***conditionalReconfiguration***  This field is used to configure the UE with a conditional reconfiguration. The reconfiguration is applied when the execution condition(s) is fulfilled. The field is absent if *daps-HO* is configured for any DRB or if *MobilityControlInfo* is included in the *RRCConnectionReconfiguration* message. The *conditionalReconfiguration* is not configured in the *RRCConnectionReconfiguration* message included in a *conditionalReconfiguration.* |
| ***daps-SourceRelease***  A one-shot field that indicates that the UE shall release the resources associated with source PCell at a DAPS HO, including reconfiguration of the PDCP entity to release DAPS. |
| ***dedicatedInfoNASList***  This field is used to transfer UE specific NAS layer information between the network and the UE. The RRC layer is transparent for each PDU in the list. If *dedicatedInfoNASList-r15* is present, UE shall ignore the *dedicatedInfoNASList* (without suffix). |
| ***endc-ReleaseAndAdd***  A one-shot field indicating whether the UE simultaneously releases and adds all the NR SCG related configuration within *nr-Config*, i.e. the configuration set by the NR *RRCReconfiguration* message (e.g. *secondaryCellGroup, SRB3* and *measConfig)*. |
| ***fullConfig***  Indicates the full configuration option is applicable for the RRC Connection Reconfiguration message for intra-system intra-RAT handover. For inter-RAT handover from NR to E-UTRA, *fullConfig* indicates whether or not delta signalling of SDAP/PDCP from source RAT is applicable. This field is absent when the *RRCConnectionReconfiguration* message is generated by the E-UTRA SCG. |
| ***keyChangeIndicator***  If UE is connected to EPC, true is used only in an intra-cell handover when a KeNB key is derived from a KASME key taken into use through the latest successful NAS SMC procedure, as described in TS 33.401 [32] for KeNB re-keying. false is used in an intra-LTE handover when the new KeNB key is obtained from the current KeNB key or from the NH as described in TS 33.401 [32].  If UE is connected to 5GC, with keyChangeIndicator-r15, true is used in an intra-cell handover when a KeNB key is derived from a KAMF key taken into use through the latest successful NAS SMC procedure, as described in TS 33.501 [86] for KeNB re-keying.  False is used for intra-system handover when the new KeNB key is obtained from the current KeNB key or from the NH as described in TS 33.501 [86]. True is also used in NG based handover procedure with KAMF change, when a KeNB key is derived from the new KAMF key as described in TS 33.501 [86]. |
| ***lwa-Configuration***  This field is used to provide parameters for LWA configuration. E-UTRAN does not simultaneously configure LWA with DC, LWIP or RCLWI for a UE. |
| ***lwip-Configuration***  This field is used to provide parameters for LWIP configuration. E-UTRAN does not simultaneously configure LWIP with DC, LWA or RCLWI for a UE. |
| ***measConfig***  Measurements that E-UTRAN may configure when the UE is not configured with NE-DC. |
| ***measConfigSN***  Measurements that E-UTRAN may configure when the UE is configured with NE-DC and for which reports are carried within an NR RRC message. |
| ***nas-Container***  This field is used to transfer UE specific NAS layer information between the network and the UE. The RRC layer is transparent for this field, although, if included, it affects activation of AS- security after handover within E-UTRA/5GC. The content is defined in TS 24.501 [95]. In case of NG based handover, the content of nas-Container is. the Intra N1 mode NAS transparent container IE. In case of inter-system handover to from 5GS to EPS, the content of NAS-Container is. the S1 mode to N1 mode NAS transparent container IE. |
| ***nas-securityParamToEUTRA***  This field is used to transfer UE specific NAS layer information between the network and the UE. The RRC layer is transparent for this field, although, if included, it affects activation of AS- security after inter-RAT handover to E-UTRA/EPC or inter-system handover to E-UTRA/EPC. The content is defined in TS 24.301 [35]. This field is not used for handover from 5GC. |
| ***networkControlledSyncTx***  This field indicates whether the UE shall transmit synchronisation information (i.e. become synchronisation source). Value *On* indicates the UE to transmit synchronisation information while value *Off* indicates the UE to not transmit such information. |
| ***nextHopChainingCount***  Parameter NCC: See TS 33.401 [32] if UE is connected to EPC, else see 33.501 [86] if UE is connected to 5GC. |
| ***nr-Config***  Includes the NR related configurations. This field is used to configure (NG)EN-DC configuration, possibly in conjunction with fields *sk-Counter* and *nr-RadioBearerConfig1/ 2*. NOTE 1. |
| ***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, conditionalReconfiguration, otherConfig, bap-Config, iab-IP-AddressConfigurationList* and/ or *measConfig*. If *nr-SecondaryCellGroupConfig* is configured, the network always includes this field upon MN handover to initiate an NR SCG reconfiguration with sync and key change. |
| ***perCC-GapIndicationRequest***  Indicates that UE shall include *perCC-GapIndicationList* and *numFreqEffective* in the *RRCConnectionReconfigurationComplete* message. *numFreqEffectiveReduced* may also be included if frequencies are configured for reduced measurement performance. |
| ***p-MaxEUTRA***  Indicates the maximum power available for LTE. |
| ***p-MaxUE-FR1***  The maximum total transmit power to be used by the UE across all serving cells in frequency range 1 (FR1) across all cell groups. The maximum transmit power that the UE may use may be additionally limited on cell- or cell-group level. The field is optionally present, if (NG)EN-DC (nr-Config-r15) has been configured. It is absent otherwise. |
| ***p-MeNB***  Indicates the guaranteed power for the MeNB, as specified in TS 36.213 [23]. The value N corresponds to N-1 in TS 36.213 [23]. |
| ***powerControlMode***  Indicates the power control mode used in DC. Value 1 corresponds to DC power control mode 1 and value 2 indicates DC power control mode 2, as specified in TS 36.213 [23]. |
| ***p-SeNB***  Indicates the guaranteed power for the SeNB as specified in TS 36.213 [23], Table 5.1.4.2-1. The value N corresponds to N-1 in TS 36.213 [23]. |
| ***rclwi-Configuration***  WLAN traffic steering command as specified in 5.6.16.2. E-UTRAN does not simultaneously configure RCLWI with DC, LWA or LWIP for a UE. |
| ***sCellConfigCommon***  Indicates the common configuration for the SCell group. |
| ***sCellGroupIndex***  Indicates the identity of SCell groups for which a common configuration is provided. |
| ***sCellIndex***  The *sCellIndex* is unique within the scope of the UE. In case of DC, an SCG cell can not use the same value as used for an MCG cell. For *pSCellToAddMod*, if *sCellIndex-r13* is present the UE shall ignore *sCellIndex-r12.* |
| ***sCellGroupToAddModList, sCellGroupToAddModListSCG***  Indicates the SCell group to be added or modified. E-UTRAN only configures at most 4 SCell groups per UE over all cell groups. SCell groups can only be configured for LTE SCells, and all SCells in an SCell group must belong to the same cell group. |
| ***sCellGroupToReleaseList***  Indicates the SCell group to be released. |
| ***sCellState***  A one-shot field that indicates whether the SCell shall be considered to be in activated or dormant state upon SCell configuration. |
| ***sCellToAddModList, sCellToAddModListExt***  Indicates the SCell to be added or modified. E-UTRAN uses field *sCellToAddModList-r10* to add or modify SCells (with *sCellIndex-r10*) for a UE that does not support carrier aggregation with more than 5 component carriers. If E-UTRAN includes *sCellToAddModListExt-v1430* it includes the same number of entries, and listed in the same order, as in *sCellToAddModListExt-r13*. If E-UTRAN includes *sCellToAddModList-v10l0* it includes the same number of entries, and listed in the same order, as in *sCellToAddModList-r10*. If E-UTRAN includes *sCellToAddModListExt-v1370* it includes the same number of entries, and listed in the same order, as in *sCellToAddModListExt-r13*. If E-UTRAN includes *sCellToAddModListExt-v13c0* it includes the same number of entries, and listed in the same order, as in *sCellToAddModListExt-r13.* |
| ***sCellToAddModListSCG, sCellToAddModListSCG-Ext***  Indicates the SCG cell to be added or modified. The field is used for SCG cells other than the PSCell (which is added/ modified by field *pSCellToAddMod*). E-UTRAN uses field *sCellToAddModListSCG-r12* to add or modify SCells (with *sCellIndex-r10*) for a UE that does not support carrier aggregation with more than 5 component carriers. If E-UTRAN includes *sCellToAddModListSCG-v10l0* it includes the same number of entries, and listed in the same order, as in *sCellToAddModListSCG-r12*. If E-UTRAN includes *sCellToAddModListSCG-Ext-v1370* it includes the same number of entries, and listed in the same order, as in *sCellToAddModListSCG-Ext-r13*. If E-UTRAN includes *sCellToAddModListSCG-Ext-v13c0* it includes the same number of entries, and listed in the same order, as in *sCellToAddModListSCG-Ext-r13.* |
| ***sCellToReleaseList, sCellToReleaseListExt***  Indicates the SCell to be released. E-UTRAN uses field *sCellToReleaseList-r10* to release SCells for a UE that does not support carrier aggregation with more than 5 component carriers. |
| ***sCellToReleaseListSCG, sCellToReleaseListSCG-Ext***  Indicates the SCG cell to be released. The field is also used to release the PSCell e.g. upon change of PSCell, upon system information change for the PSCell. E-UTRAN uses field *sCellToReleaseListSCG-r12* to release SCells for a UE that does not support carrier aggregation with more than 5 component carriers. |
| ***scg-Configuration***  Covers the SCG configuration as used in case of DC and NE-DC. When the UE is configured with NE-DC, E-UTRAN neither applies value release nor configures *scg-ConfigPartMCG*. When resuming a connection with NE-DC, this field is included, containing at least the *mobilityControlInfoSCG*. |
| ***scg-Counter***  A counter used upon initial configuration of SCG security as well as upon refresh of S-KeNB. E-UTRAN includes the field upon SCG change when one or more SCG DRBs are configured. Otherwise E-UTRAN does not include the field. |
| ***scg-State***  Indicates that the NR SCG is deactivated. The field is absent if the CPAC is configured for the UE, or if the *RRCConnectionReconfiguration* message is contained in *condReconfigurationToApply*. |
| ***securityConfigHO***  This field contains the parameters required to update the security keys at handover. If E-UTRAN includes the *securityConfigHO* (i.e., without suffix), the choice *intraLTE* is used for handover within E-UTRA/EPC while the choice *interRAT* is used for handover from GERAN or UTRAN to E-UTRA/EPC. If E-UTRAN includes the *securityConfigHO-v1530* (i.e., with suffix), the choice *intra5GC* is used for handover from NR or E-UTRA/5GC to E-UTRA/5GC while the choice *fivegc-ToEPC* is used for inter-system handover from NR or E-UTRA/5GC to E-UTRA/EPC and the choice *epc-To5GC* is used for inter-system handover from E-UTRA/EPC to E-UTRA/5GC. |
| ***sk-Counter***  A one-shot counter used upon initial configuration of S-KgNB as well as upon refresh of S-KgNB. E-UTRAN always provides this field either upon initial configuration of an NR SCG, or upon configuration of the first (SN terminated) RB using S-KgNB, whichever happens first. |
| ***sl-ConfigDedicatedForNR***  Container for providing the dedicated configurations for NR sidelink communication, the octet string contains the NR *RRCReconfiguration* message as specified in TS 38.331 [82]. In this version of the specification, the NR RRC message only includes fields related to NR sidelink communication, i.e. *sl-ConfigDedicatedNR*, *measConfig* and/or *otherConfig*. If the UE is configured by the current Pcell with *sl-ScheduledConfig* set to setup (i.e., NR sidelink communication mode 1), the network only includes *sl-PrioritizationThres* and *sl-ConfiguredGrantConfig* that only includes the configurations of configured sidelink grant Type 1 in the field *sl-ScheduledConfig*. |
| ***sl-SSB-PriorityEUTRA***  Indicates the priority of LTE PSSS/SSSS/PSBCH transmission and reception. NOTE 3. |
| ***sl-V2X-ConfigDedicated***  Indicates sidelink configuration for non-P2X related V2X sidelink communication as well as P2X related V2X sidelink communication. |
| ***smtc***  The SSB periodicity/offset/duration configuration of target cell for NR PSCell addition and SN change. It is based on timing reference of EUTRA PCell. NOTE 2.  If the field is absent, the UE uses the SMTC in the *measObjectNR* having the same SSB frequency and subcarrier spacing, as configured before the reception of the RRC message. |
| ***srs-SwitchFromServCellIndex***  Indicates the serving cell whose UL transmission may be interrupted during SRS transmission on a PUSCH-less cell. During SRS transmission on a PUSCH-less cell, the UE may temporarily suspend the UL transmission on a serving cell with PUSCH in the same CG to allow the PUSCH-less cell to transmit SRS. The PUSCH-less cell is always a TDD cell but the serving cell with PUSCH may be either a FDD or TDD cell. |
| ***systemInformationBlockType1Dedicated***  This field is used to transfer *SystemInformationBlockType1* or *SystemInformationBlockType1-BR* to the UE. |
| ***systemInformationBlockType2Dedicated***  This field is used to transfer BR version of *SystemInformationBlockType2* to BL UEs or UEs in CE or *SystemInformationBlockType2* to non-BL UEs. |
| ***systemInformationBlockType31Dedicated***  This field is used to transfer *SystemInformationBlockType31* to BL UEs or UEs in CE in a NTN cell. |
| ***t350***  Timer T350 as described in clause 7.3. Value *minN* corresponds to N minutes. |
| ***tdm-PatternConfig***  This field is used when power control or IMD issues require single UL transmission in (NG)EN-DC as specified in TS 38.101-3 [101] and TS 38.213 [88]. |
| ***tdm-PatternConfig2***  This field is used for dual UL transmission in EN-DC with LTE FDD PCell and for single UL transmission in EN-DC with LTE FDD/TDD PCell, as specified in TS 38.101-3 [101] and TS 38.213 [88].  The network sets at most one of *tdm-PatternConfig* and *tdm-PatternConfig2* to setup.  When this field is configured in EN-DC with LTE TDD PCell, it is not applicable if TDD configuration is sa0 or sa6 in SIB1. |
| ***tdm-PatternConfigNE-DC***  This field is used when power control or IMD issues require single UL transmission in NE-DC as specified in TS 38.101-3 [101] and TS 38.213 [88]. |

| Conditional presence | Explanation |
| --- | --- |
| *EARFCN-max* | The field is mandatory present if *dl-CarrierFreq-r10* is included and set to *maxEARFCN*. Otherwise the field is not present. |
| *FDD-PCell* | This field is optionally present, need ON, for a FDD PCell if there is no SCell with configured uplink. Otherwise, the field is not present. |
| *FDD-PSCell* | This field is optionally present, need ON, for a FDD PSCell if there is no SCell with configured uplink. Otherwise, the field is not present. |
| *fullConfig* | This field is mandatory present for handover within E-UTRA when the *fullConfig* is included; otherwise it is optionally present, Need OP. |
| *HO* | The field is mandatory present in case of handover within E-UTRA or to E-UTRA and in a message contained in a NR *DLInformationTransferMRDC* message; otherwise the field is not present. The field is not present if source PCell resources after a DAPS handover have not been released. |
| *HO-Reestab* | The field is mandatory present in case of inter-system handover within E-UTRA or handover from NR to E-UTRA/EPC; it is optionally present, need ON, in case of intra-system handover within E-UTRA or upon the first reconfiguration after RRC connection re-establishment; or for intra-system handover from NR to E-UTRA, otherwise the field is not present. |
| *HO-5GC* | The field is mandatory present in case of handover within E-UTRA/5GC, handover to E-UTRA/5GC, handover from NR to E-UTRA/EPC, or handover from E-UTRA/5GC to E-UTRA/EPC, otherwise the field is not present. |
| *NTN* | The field is mandatory present in case of handover to a NTN cell. Otherwise the field is optionally present, Need ON, in a NTN cell. |
| *HO-toEPC* | The field is mandatory present in case of handover within E-UTRA/EPC or to E-UTRA/EPC, except handover from NR or E-UTRA/5GC, otherwise the field is not present. |
| *HO-toEUTRA* | The field is mandatory present in case of handover to E-UTRA or for reconfigurations when *fullConfig* is included; otherwise the field is optionally present, need ON. |
| *nonFullConfig* | The field is not present when the *fullConfig* is included or in case of handover to E-UTRA; otherwise it is optional present, need ON. |
| *nonHO* | The field is not present in case of handover within E-UTRA or to E-UTRA; otherwise it is optional present, need ON. |
| *SCellAdd* | The field is mandatory present upon SCell addition; otherwise it is not present. |
| *SCellAdd2* | The field is mandatory present upon SCell addition; otherwise it is optionally present, need ON. |

NOTE 1: Fields *sk-Counter* and *nr-RadioBearerConfig1/ 2* are placed outside *nr-Config*, as these may be configured while the UE is not configured with (NG)EN-DC.

NOTE 2: It is not specified whether the timing reference for the SMTC configuration is the source EUTRA PCell or the target EUTRA PCell in case the NR PSCell addition or SN change takes place simultaneously with handover. As a consequence, explicit SMTC configuration is only supported when the source EUTRA PCell and the target EUTRA PCell of the handover are SFN/subframe-synchronized.

NOTE 3: For UEs in RRC\_IDLE, RRC\_INACTIVE or out-of coverage, and for the case that *sl-SSB-PriorityEUTRA* is absent, it is up to UE implementation to decide the priority of LTE PSSS/SSSS/PSBCH transmission and reception.

#### – *RRCConnectionReconfigurationComplete*

The *RRCConnectionReconfigurationComplete* message is used to confirm the successful completion of an RRC connection reconfiguration.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E‑UTRAN

*RRCConnectionReconfigurationComplete message*

-- ASN1START

RRCConnectionReconfigurationComplete ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

rrcConnectionReconfigurationComplete-r8

RRCConnectionReconfigurationComplete-r8-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

RRCConnectionReconfigurationComplete-r8-IEs ::= SEQUENCE {

nonCriticalExtension RRCConnectionReconfigurationComplete-v8a0-IEs OPTIONAL

}

RRCConnectionReconfigurationComplete-v8a0-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension RRCConnectionReconfigurationComplete-v1020-IEs OPTIONAL

}

RRCConnectionReconfigurationComplete-v1020-IEs ::= SEQUENCE {

rlf-InfoAvailable-r10 ENUMERATED {true} OPTIONAL,

logMeasAvailable-r10 ENUMERATED {true} OPTIONAL,

nonCriticalExtension RRCConnectionReconfigurationComplete-v1130-IEs OPTIONAL

}

RRCConnectionReconfigurationComplete-v1130-IEs ::= SEQUENCE {

connEstFailInfoAvailable-r11 ENUMERATED {true} OPTIONAL,

nonCriticalExtension RRCConnectionReconfigurationComplete-v1250-IEs OPTIONAL

}

RRCConnectionReconfigurationComplete-v1250-IEs ::= SEQUENCE {

logMeasAvailableMBSFN-r12 ENUMERATED {true} OPTIONAL,

nonCriticalExtension RRCConnectionReconfigurationComplete-v1430-IEs OPTIONAL

}

RRCConnectionReconfigurationComplete-v1430-IEs ::= SEQUENCE {

perCC-GapIndicationList-r14 PerCC-GapIndicationList-r14 OPTIONAL,

numFreqEffective-r14 INTEGER (1..12) OPTIONAL,

numFreqEffectiveReduced-r14 INTEGER (1..12) OPTIONAL,

nonCriticalExtension RRCConnectionReconfigurationComplete-v1510-IEs OPTIONAL

}

RRCConnectionReconfigurationComplete-v1510-IEs ::= SEQUENCE {

scg-ConfigResponseNR-r15 OCTET STRING OPTIONAL,

nonCriticalExtension RRCConnectionReconfigurationComplete-v1530-IEs OPTIONAL

}

RRCConnectionReconfigurationComplete-v1530-IEs ::= SEQUENCE {

logMeasAvailableBT-r15 ENUMERATED {true} OPTIONAL,

logMeasAvailableWLAN-r15 ENUMERATED {true} OPTIONAL,

flightPathInfoAvailable-r15 ENUMERATED {true} OPTIONAL,

nonCriticalExtension RRCConnectionReconfigurationComplete-v1700-IEs

OPTIONAL

}

RRCConnectionReconfigurationComplete-v1700-IEs ::= SEQUENCE {

selectedCondReconfigurationToApply-r17 CondReconfigurationId-r16 OPTIONAL,

nonCriticalExtension RRCConnectionReconfigurationComplete-v1710-IEs

OPTIONAL

}

RRCConnectionReconfigurationComplete-v1710-IEs ::= SEQUENCE {

gnss-ValidityDuration-r17 GNSS-ValidityDuration-r17 OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

| *RRCConnectionReconfigurationComplete* field descriptions |
| --- |
| ***numFreqEffective***  This field is used to indicate the number of effective frequencies that a UE measures in series according to TS 36.133 [16]. Simultaneous measurement in parallel on multiple frequencies can be equivalent to a single effective frequency. The frequencies configured for reduced measurement performance should not be included. |
| ***numFreqEffectiveReduced***  This field is used to indicate the number of effective frequencies that a UE measures in series according to TS 36.133 [16] for frequencies configured for reduced measurement performance. Simultaneous measurement in parallel on multiple frequencies can be equivalent to a single effective frequency. |
| ***perCC-GapIndicationList***  This field is used to indicate per CC measurement gap preference by the UE. |
| ***scg-ConfigResponseNR***  Includes the NR *RRCReconfigurationComplete* message as defined in TS 38.331 [82]. |
| ***selectedCondReconfigurationToApply***  This field indicates the selected conditional RRC connection reconfiguration the UE applied upon the execution of CPA or inter-SN CPC. |

#### – *RRCConnectionReestablishment*

The *RRCConnectionReestablishment* message is used to re-establish SRB1.

Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH

Direction: E‑UTRAN to UE

*RRCConnectionReestablishment message*

-- ASN1START

RRCConnectionReestablishment ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

c1 CHOICE{

rrcConnectionReestablishment-r8 RRCConnectionReestablishment-r8-IEs,

spare7 NULL,

spare6 NULL, spare5 NULL, spare4 NULL,

spare3 NULL, spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

RRCConnectionReestablishment-r8-IEs ::= SEQUENCE {

radioResourceConfigDedicated RadioResourceConfigDedicated,

nextHopChainingCount NextHopChainingCount,

nonCriticalExtension RRCConnectionReestablishment-v8a0-IEs OPTIONAL

}

RRCConnectionReestablishment-v8a0-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

#### – *RRCConnectionReestablishmentComplete*

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

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E‑UTRAN

*RRCConnectionReestablishmentComplete message*

-- ASN1START

RRCConnectionReestablishmentComplete ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

rrcConnectionReestablishmentComplete-r8

RRCConnectionReestablishmentComplete-r8-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

RRCConnectionReestablishmentComplete-r8-IEs ::= SEQUENCE {

nonCriticalExtension RRCConnectionReestablishmentComplete-v920-IEs OPTIONAL

}

RRCConnectionReestablishmentComplete-v920-IEs ::= SEQUENCE {

rlf-InfoAvailable-r9 ENUMERATED {true} OPTIONAL,

nonCriticalExtension RRCConnectionReestablishmentComplete-v8a0-IEs OPTIONAL

}

RRCConnectionReestablishmentComplete-v8a0-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension RRCConnectionReestablishmentComplete-v1020-IEs OPTIONAL

}

RRCConnectionReestablishmentComplete-v1020-IEs ::= SEQUENCE {

logMeasAvailable-r10 ENUMERATED {true} OPTIONAL,

nonCriticalExtension RRCConnectionReestablishmentComplete-v1130-IEs OPTIONAL

}

RRCConnectionReestablishmentComplete-v1130-IEs ::= SEQUENCE {

connEstFailInfoAvailable-r11 ENUMERATED {true} OPTIONAL,

nonCriticalExtension RRCConnectionReestablishmentComplete-v1250-IEs OPTIONAL

}

RRCConnectionReestablishmentComplete-v1250-IEs ::= SEQUENCE {

logMeasAvailableMBSFN-r12 ENUMERATED {true} OPTIONAL,

nonCriticalExtension RRCConnectionReestablishmentComplete-v1530-IEs OPTIONAL

}

RRCConnectionReestablishmentComplete-v1530-IEs ::= SEQUENCE {

logMeasAvailableBT-r15 ENUMERATED {true} OPTIONAL,

logMeasAvailableWLAN-r15 ENUMERATED {true} OPTIONAL,

flightPathInfoAvailable-r15 ENUMERATED {true} OPTIONAL,

nonCriticalExtension RRCConnectionReestablishmentComplete-v1710-IEs OPTIONAL

}

RRCConnectionReestablishmentComplete-v1710-IEs ::= SEQUENCE {

gnss-ValidityDuration-r17 GNSS-ValidityDuration-r17 OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

| *RRCConnectionReestablishmentComplete* field descriptions |
| --- |
| ***rlf-InfoAvailable***  This field is used to indicate the availability of radio link failure or handover failure related measurements |

#### – *RRCConnectionReestablishmentReject*

The *RRCConnectionReestablishmentReject* message is used to indicate the rejection of an RRC connection re-establishment request.

Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH

Direction: E‑UTRAN to UE

*RRCConnectionReestablishmentReject message*

-- ASN1START

RRCConnectionReestablishmentReject ::= SEQUENCE {

criticalExtensions CHOICE {

rrcConnectionReestablishmentReject-r8

RRCConnectionReestablishmentReject-r8-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

RRCConnectionReestablishmentReject-r8-IEs ::= SEQUENCE {

nonCriticalExtension RRCConnectionReestablishmentReject-v8a0-IEs OPTIONAL

}

RRCConnectionReestablishmentReject-v8a0-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

#### – *RRCConnectionReestablishmentRequest*

The *RRCConnectionReestablishmentRequest* message is used to request the reestablishment of an RRC connection.

Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH

Direction: UE to E‑UTRAN

*RRCConnectionReestablishmentRequest message*

-- ASN1START

RRCConnectionReestablishmentRequest ::= SEQUENCE {

criticalExtensions CHOICE {

rrcConnectionReestablishmentRequest-r8

RRCConnectionReestablishmentRequest-r8-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

RRCConnectionReestablishmentRequest-r8-IEs ::= SEQUENCE {

ue-Identity ReestabUE-Identity,

reestablishmentCause ReestablishmentCause,

spare BIT STRING (SIZE (2))

}

ReestabUE-Identity ::= SEQUENCE {

c-RNTI C-RNTI,

physCellId PhysCellId,

shortMAC-I ShortMAC-I

}

ReestablishmentCause ::= ENUMERATED {

reconfigurationFailure, handoverFailure,

otherFailure, spare1

}

-- ASN1STOP

| *RRCConnectionReestablishmentRequest* field descriptions |
| --- |
| ***physCellId***  The Physical Cell Identity of the PCell the UE was connected to prior to the failure*.* |
| ***reestablishmentCause***  Indicates the failure cause that triggered the re-establishment procedure. eNB is not expected to reject a *RRCConnectionReestablishmentRequest* due to unknown cause value being used by the UE. |
| ***ue-Identity***  UE identity included to retrieve UE context and to facilitate contention resolution by lower layers. |

#### – *RRCConnectionReject*

The *RRCConnectionReject* message is used to reject the RRC connection establishment or to reject the EDT procedure.

Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH

Direction: E‑UTRAN to UE

*RRCConnectionReject message*

-- ASN1START

RRCConnectionReject ::= SEQUENCE {

criticalExtensions CHOICE {

c1 CHOICE {

rrcConnectionReject-r8 RRCConnectionReject-r8-IEs,

spare3 NULL, spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

RRCConnectionReject-r8-IEs ::= SEQUENCE {

waitTime INTEGER (1..16),

nonCriticalExtension RRCConnectionReject-v8a0-IEs OPTIONAL

}

RRCConnectionReject-v8a0-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension RRCConnectionReject-v1020-IEs OPTIONAL

}

RRCConnectionReject-v1020-IEs ::= SEQUENCE {

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

nonCriticalExtension RRCConnectionReject-v1130-IEs OPTIONAL

}

RRCConnectionReject-v1130-IEs ::= SEQUENCE {

deprioritisationReq-r11 SEQUENCE {

deprioritisationType-r11 ENUMERATED {frequency, e-utra},

deprioritisationTimer-r11 ENUMERATED {min5, min10, min15, min30}

} OPTIONAL, -- Need ON

nonCriticalExtension RRCConnectionReject-v1320-IEs OPTIONAL

}

RRCConnectionReject-v1320-IEs ::= SEQUENCE {

rrc-SuspendIndication-r13 ENUMERATED {true} OPTIONAL, -- Need ON

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

| *RRCConnectionReject* field descriptions |
| --- |
| ***deprioritisationReq***  Indicates whether the current frequency or RAT is to be de-prioritised. The UE shall be able to store a depriotisation request for up to 8 frequencies (applicable when receiving another frequency specific deprioritisation request before T325 expiry). |
| ***deprioritisationTimer***  Indicates the period for which either the current carrier frequency or E-UTRA is deprioritised. Value *minN* corresponds to N minutes. |
| ***extendedWaitTime***  Value in seconds for the wait time for Delay Tolerant access requests. |
| ***rrc-SuspendIndication***  If present, this field indicates that the UE should remain suspended and not release its stored context. |
| ***waitTime***  Wait time value in seconds. |

#### – *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-EDTorPUR

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-v15b0-IEs OPTIONAL

}

RRCConnectionRelease-v15b0-IEs ::= SEQUENCE {

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

nonCriticalExtension RRCConnectionRelease-v1610-IEs OPTIONAL

}

RRCConnectionRelease-v1610-IEs ::= SEQUENCE {

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

shortI-RNTI-r16 ShortI-RNTI-r15 OPTIONAL, -- Need OR

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

rrc-InactiveConfig-v1610 RRC-InactiveConfig-v1610 OPTIONAL, -- Cond BLCE-IDLEeDRX

releaseIdleMeasConfig-r16 ENUMERATED {true} OPTIONAL, -- Need ON

altFreqPriorities-r16 ENUMERATED {true} OPTIONAL, -- Need ON

t323-r16 ENUMERATED {

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

min720} OPTIONAL, -- Need OR

nonCriticalExtension RRCConnectionRelease-v1650-IEs OPTIONAL

}

RRCConnectionRelease-v1650-IEs ::= SEQUENCE {

mpsPriorityIndication-r16 ENUMERATED {true} OPTIONAL, -- Cond Redirection2

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-v1610::= SEQUENCE {

ran-PagingCycle-v1610 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 |
| --- |
| ***altFreqPriorities***  Indicates that the UE shall apply the alternative cell reselectionpriorities, when available. This field is not configured together with *idleModeMobilityControlInfo*. |
| ***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. |
| ***mpsPriorityIndication***  Indicates the UE can set the establishment cause to *highPriorityAccess* for a new connection to a new RAT following a redirect to E-UTRA. If the target RAT is NR, see TS 38.331 [82]. The eNB/ng-eNB sets the indication only for UEs authorized to receive MPS treatment as indicated by ARP and/or QoS characteristics at the eNB/ng-eNB, and it is applicable only for this instance of release with redirection to carrier/RAT included in the *redirectedCarrierInfo* field in the *RRCConnectionRelease* message. |
| ***noLastCellUpdate***  Presence of the field indicates that the last used cell for (G)WUS shall not be updated. |
| ***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. The network does not set the *releaseCause* to *rrc-Suspend* if the UE is configured with a DAPS bearer, i.e. if source PCell resources after a DAPS handover have not been released. |
| ***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 or if the UE is configured with a DAPS bearer. |
| ***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 (FR1), 120 kHz or 240 kHz (FR2) 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. |
| ***t323***  Timer T323 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. |
| *Redirection2* | The field is optionally present, Need OR, if *redirectedCarrierInfo* is included; otherwise the field is not present. |
| *UP-EDTorPUR* | The field is optionally present, Need ON, if the UE supports UP-EDT or UP transmission using PUR and *releaseCause* is set to *rrc-Suspend*; otherwise the field is not present. |

#### – *RRCConnectionRequest*

The *RRCConnectionRequest* message is used to request the establishment of an RRC connection.

Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH

Direction: UE to E‑UTRAN

*RRCConnectionRequest message*

-- ASN1START

RRCConnectionRequest ::= SEQUENCE {

criticalExtensions CHOICE {

rrcConnectionRequest-r8 RRCConnectionRequest-r8-IEs,

rrcConnectionRequest-r15 RRCConnectionRequest-5GC-r15-IEs

}

}

RRCConnectionRequest-r8-IEs ::= SEQUENCE {

ue-Identity InitialUE-Identity,

establishmentCause EstablishmentCause,

spare BIT STRING (SIZE (1))

}

RRCConnectionRequest-5GC-r15-IEs ::= SEQUENCE {

ue-Identity InitialUE-Identity-5GC,

establishmentCause EstablishmentCause-5GC,

spare BIT STRING (SIZE (1))

}

InitialUE-Identity ::= CHOICE {

s-TMSI S-TMSI,

randomValue BIT STRING (SIZE (40))

}

InitialUE-Identity-5GC ::= CHOICE {

ng-5G-S-TMSI-Part1 BIT STRING (SIZE (40)),

randomValue BIT STRING (SIZE (40))

}

EstablishmentCause ::= ENUMERATED {

emergency, highPriorityAccess, mt-Access, mo-Signalling,

mo-Data, delayTolerantAccess-v1020, mo-VoiceCall-v1280, spare1}

EstablishmentCause-5GC ::= ENUMERATED {

emergency, highPriorityAccess, mt-Access, mo-Signalling,

mo-Data, mo-VoiceCall, spare2, spare1}

-- ASN1STOP

| *RRCConnectionRequest* field descriptions |
| --- |
| ***establishmentCause***  Provides the establishment cause for the RRC connection request as provided by the upper layers. W.r.t. the cause value names: highPriorityAccess concerns AC11..AC15, 'mt' stands for 'Mobile Terminating' and 'mo' for 'Mobile Originating. eNB is not expected to reject a *RRCConnectionRequest* due to unknown cause value being used by the UE. The cause value of *delayTolerantAccess* is not used for E-UTRA/5GC in this release. |
| ***randomValue***  Integer value in the range 0 to 240 − 1. |
| ***ng-5G-S-TMSI-Part1***  The rightmost 40 bits of 5G-S-TMSI. |
| ***ue-Identity***  UE identity included to facilitate contention resolution by lower layers. |

#### – *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-v1610-IEs OPTIONAL

}

RRCConnectionResume-v1610-IEs ::= SEQUENCE {

idleModeMeasurementReq-r16 ENUMERATED {true} OPTIONAL, -- Need ON

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

restoreSCG ENUMERATED {true} OPTIONAL, -- Cond EarlySec

sCellToAddModList-r16 SCellToAddModList-r16 OPTIONAL, -- Cond EarlySec

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

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

sCellGroupToAddModList-r16 SCellGroupToAddModList-r15 OPTIONAL, -- Cond EarlySec

nr-SecondaryCellGroupConfig OCTET STRING OPTIONAL, -- Cond RestoreSCG

p-MaxEUTRA-r16 P-Max OPTIONAL, -- Cond SCG

p-MaxUE-FR1-r16 P-Max OPTIONAL, -- Cond SCG

tdm-PatternConfig-r16 TDM-PatternConfig-r15 OPTIONAL, -- Cond FDD-PCell

tdm-PatternConfig2-r16 TDM-PatternConfig-r15 OPTIONAL, -- Need OR

nonCriticalExtension RRCConnectionResume-v1700-IEs OPTIONAL

}

RRCConnectionResume-v1700-IEs ::= SEQUENCE {

scg-State-r17 ENUMERATED {deactivated} OPTIONAL, -- Need OP

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 |
| ***p-MaxEUTRA***  Indicates the maximum power available for E-UTRA. |
| ***p-MaxUE-FR1***  The maximum total transmit power to be used by the UE across all serving cells in frequency range 1 (FR1) across all cell groups. The maximum transmit power that the UE may use may be additionally limited on cell- or cell-group level. |
| ***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*, with at least *reconfigurationWithSync, otherConfig* and/ or *measConfig*. |
| ***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. |
| ***sCellGroupToAddModList***  Indicates the SCell group to be added or modified. |
| ***sCellGroupToReleaseList***  Indicates the SCell group to be released. |
| ***sCellToAddModList***  List of SCells to be added or modified. |
| ***sCellToReleaseList***  List of SCells to be released. |
| ***scg-State***  Indicates that the SCG is deactivated. |
| ***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 or NR SCG is configured. |
| ***tdm-PatternConfig***  This field is used when power control or IMD issues require single UL transmission in (NG)EN-DC as specified in TS 38.101-3 [101] and TS 38.213 [88]. |
| ***tdm-PatternConfig2***  This field is used for dual UL transmission in EN-DC with LTE FDD PCell and for single UL transmission in EN-DC with LTE FDD/TDD PCell, as specified in TS 38.101-3 [101] and TS 38.213 [88].  The network sets at most one of *tdm-PatternConfig* and *tdm-PatternConfig2* to setup.  When this field is configured in EN-DC with LTE TDD PCell, it is not applicable if TDD configuration is sa0 or sa6 in SIB1. |

| Conditional presence | Explanation |
| --- | --- |
| *EarlySec* | For EPC, the field is optionally present, Need ON, if the UE supports early security reactivation; otherwise the field is not present.  For 5GC, the field is optionally present, Need ON. |
| *RestoreSCG* | The field is mandatory present if *restoreSCG* is configured. It is optionally present, Need ON, otherwise.  For EPC, this field can be present only if the UE supports early security reactivation. |
| *FDD-PCell* | This field is optionally present, need ON, for an FDD PCell if there is no SCell with configured uplink. Otherwise, the field is not present, need OR. |
| *SCG* | This field is optionally present, need OR, if *nr-SecondaryCellGroupConfig* is present, otherwise it is absent, need OR. |

#### – *RRCConnectionResumeComplete*

The *RRCConnectionResumeComplete* message is used to confirm the successful completion of an RRC connection resumption.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E‑UTRAN

*RRCConnectionResumeComplete* message

-- ASN1START

RRCConnectionResumeComplete-r13 ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

rrcConnectionResumeComplete-r13 RRCConnectionResumeComplete-r13-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

RRCConnectionResumeComplete-r13-IEs ::= SEQUENCE {

selectedPLMN-Identity-r13 INTEGER (1..maxPLMN-r11) OPTIONAL,

dedicatedInfoNAS-r13 DedicatedInfoNAS OPTIONAL,

rlf-InfoAvailable-r13 ENUMERATED {true} OPTIONAL,

logMeasAvailable-r13 ENUMERATED {true} OPTIONAL,

connEstFailInfoAvailable-r13 ENUMERATED {true} OPTIONAL,

mobilityState-r13 ENUMERATED {normal, medium, high, spare} OPTIONAL,

mobilityHistoryAvail-r13 ENUMERATED {true} OPTIONAL,

logMeasAvailableMBSFN-r13 ENUMERATED {true} OPTIONAL,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension RRCConnectionResumeComplete-v1530-IEs OPTIONAL

}

RRCConnectionResumeComplete-v1530-IEs ::= SEQUENCE {

logMeasAvailableBT-r15 ENUMERATED {true} OPTIONAL,

logMeasAvailableWLAN-r15 ENUMERATED {true} OPTIONAL,

idleMeasAvailable-r15 ENUMERATED {true} OPTIONAL,

flightPathInfoAvailable-r15 ENUMERATED {true} OPTIONAL,

nonCriticalExtension RRCConnectionResumeComplete-v1610-IEs OPTIONAL

}

RRCConnectionResumeComplete-v1610-IEs ::= SEQUENCE {

measResultListIdle-r16 MeasResultListIdle-r15 OPTIONAL,

measResultListExtIdle-r16 MeasResultListExtIdle-r16 OPTIONAL,

measResultListIdleNR-r16 MeasResultListIdleNR-r16 OPTIONAL,

scg-ConfigResponseNR-r16 OCTET STRING OPTIONAL,

nonCriticalExtension RRCConnectionResumeComplete-v1710-IEs OPTIONAL

}

RRCConnectionResumeComplete-v1710-IEs ::= SEQUENCE {

gnss-ValidityDuration-r17 GNSS-ValidityDuration-r17 OPTIONAL,

nonCriticalExtension SEQUENCE{} OPTIONAL

}

-- ASN1STOP

| *RRCConnectionResumeComplete* field descriptions |
| --- |
| ***idleMeasAvailable***  Indication that the UE has idle/inactive measurement report available. |
| ***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. The *selectedPLMN-Identity* is referred to the PLMN list for 5GC if the UE is in RRC\_INACTIVE state. |

#### – *RRCConnectionResumeRequest*

The *RRCConnectionResumeRequest* message is used to request the resumption of a suspended RRC connection or to perform UP-EDT.

Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH

Direction: UE to E‑UTRAN

*RRCConnectionResumeRequest* message

-- ASN1START

RRCConnectionResumeRequest-r13 ::= SEQUENCE {

criticalExtensions CHOICE {

rrcConnectionResumeRequest-r13 RRCConnectionResumeRequest-r13-IEs,

rrcConnectionResumeRequest-r15 RRCConnectionResumeRequest-5GC-r15-IEs

}

}

RRCConnectionResumeRequest-r13-IEs ::= SEQUENCE {

resumeIdentity-r13 CHOICE {

resumeID-r13 ResumeIdentity-r13,

truncatedResumeID-r13 BIT STRING (SIZE (24))

},

shortResumeMAC-I-r13 BIT STRING (SIZE (16)),

resumeCause-r13 ResumeCause,

spare BIT STRING (SIZE (1))

}

RRCConnectionResumeRequest-5GC-r15-IEs ::= SEQUENCE {

resumeIdentity-r15 CHOICE {

fullI-RNTI-r15 I-RNTI-r15,

shortI-RNTI-r15 ShortI-RNTI-r15

},

shortResumeMAC-I-r15 BIT STRING (SIZE (16)),

resumeCause-r15 ResumeCause-r15,

spare BIT STRING (SIZE (1))

}

ResumeCause ::= ENUMERATED {

emergency, highPriorityAccess, mt-Access, mo-Signalling,

mo-Data, delayTolerantAccess-v1020, mo-VoiceCall-v1280,

mt-EDT-v1610

}

ResumeCause-r15 ::= ENUMERATED {

emergency, highPriorityAccess, mt-Access, mo-Signalling,

mo-Data, rna-Update, mo-VoiceCall, spare1

}

-- ASN1STOP

| *RRCConnectionResumeRequest* field descriptions |
| --- |
| ***resumeCause***  Provides the resume cause for the RRC connection resume request as provided by the upper layers. The network is not expected to reject a *RRCConnectionResumeRequest* due to unknown cause value being used by the UE. |
| ***resumeIdentity***  UE identity to facilitate UE context retrieval at eNB |
| ***shortResumeMAC-I***  Authentication token to facilitate UE authentication at eNB |

#### – *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-v1610-IEs OPTIONAL

}

RRCConnectionSetup-v1610-IEs ::= SEQUENCE {

dedicatedInfoNAS-r16 DedicatedInfoNAS OPTIONAL, -- Need ON

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*. |

#### – *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

}

RRCConnectionSetupComplete-v1540-IEs ::= SEQUENCE {

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

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

nonCriticalExtension RRCConnectionSetupComplete-v1610-IEs OPTIONAL

}

RRCConnectionSetupComplete-v1610-IEs ::= SEQUENCE {

rlos-Request-r16 ENUMERATED {true} OPTIONAL,

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

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

pur-ConfigID-r16 PUR-ConfigID-r16 OPTIONAL,

lte-M-r16 ENUMERATED {true} OPTIONAL,

iab-NodeIndication-r16 ENUMERATED {true} OPTIONAL, nonCriticalExtension RRCConnectionSetupComplete-v1710-IEs OPTIONAL

}

RRCConnectionSetupComplete-v1710-IEs ::= SEQUENCE {

gnss-ValidityDuration-r17 GNSS-ValidityDuration-r17 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 as specified in TS 38.300 [106]. |
| ***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]. |

#### – *RRCEarlyDataComplete*

The *RRCEarlyDataComplete* message is used to confirm the successful completion of the CP-EDT procedure.

Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH

Direction: E‑UTRAN to UE

*RRCEarlyDataComplete* message

-- ASN1START

RRCEarlyDataComplete-r15 ::= SEQUENCE {

criticalExtensions CHOICE {

rrcEarlyDataComplete-r15 RRCEarlyDataComplete-r15-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

RRCEarlyDataComplete-r15-IEs ::= SEQUENCE {

dedicatedInfoNAS-r15 DedicatedInfoNAS OPTIONAL, -- Need ON

extendedWaitTime-r15 INTEGER (1..1800) OPTIONAL, -- Need ON

idleModeMobilityControlInfo-r15 IdleModeMobilityControlInfo OPTIONAL, -- Need OP

idleModeMobilityControlInfoExt-r15 IdleModeMobilityControlInfo-v9e0 OPTIONAL, -- Cond IdleInfoEUTRA

redirectedCarrierInfo-r15 RedirectedCarrierInfo-r15-IEs OPTIONAL, -- Need ON

nonCriticalExtension RRCEarlyDataComplete-v1590-IEs OPTIONAL

}

RRCEarlyDataComplete-v1590-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

RedirectedCarrierInfo-r15-IEs ::= CHOICE {

eutra-r15 ARFCN-ValueEUTRA-r9,

geran-r15 CarrierFreqsGERAN,

utra-FDD-r15 ARFCN-ValueUTRA,

cdma2000-HRPD-r15 CarrierFreqCDMA2000,

cdma2000-1xRTT-r15 CarrierFreqCDMA2000,

utra-TDD-r15 CarrierFreqListUTRA-TDD-r10

}

-- ASN1STOP

| *RRCEarlyDataComplete* field descriptions |
| --- |
| ***extendedWaitTime***  Value in seconds for the wait time for Delay Tolerant access requests. |

| Conditional presence | Explanation |
| --- | --- |
| *IdleInfoEUTRA* | The field is optionally present, Need OP, if the *IdleModeMobilityControlInfo-r15* is included and includes *freqPriorityListEUTRA*; otherwise the field is not present. |

#### – *RRCEarlyDataRequest*

The *RRCEarlyDataRequest* message is used to initiate CP-EDT.

Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH

Direction: UE to E‑UTRAN

*RRCEarlyDataRequest* message

-- ASN1START

RRCEarlyDataRequest-r15 ::= SEQUENCE {

criticalExtensions CHOICE {

rrcEarlyDataRequest-r15 RRCEarlyDataRequest-r15-IEs,

criticalExtensionsFuture CHOICE {

rrcEarlyDataRequest-5GC-r16 RRCEarlyDataRequest-5GC-r16-IEs,

criticalExtensionsFuture-r16 SEQUENCE {}

}

}

}

RRCEarlyDataRequest-r15-IEs ::= SEQUENCE {

s-TMSI-r15 S-TMSI,

establishmentCause-r15 ENUMERATED {mo-Data, delayTolerantAccess},

dedicatedInfoNAS-r15 DedicatedInfoNAS,

nonCriticalExtension RRCEarlyDataRequest-v1590-IEs OPTIONAL

}

RRCEarlyDataRequest-v1590-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension RRCEarlyDataRequest-v1610-IEs OPTIONAL

}

RRCEarlyDataRequest-v1610-IEs ::= SEQUENCE {

establishmentCause-v1610 ENUMERATED {mt-Access, spare3, spare2, spare1},

nonCriticalExtension SEQUENCE {} OPTIONAL

}

RRCEarlyDataRequest-5GC-r16-IEs ::= SEQUENCE {

ng-5G-S-TMSI-r16 NG-5G-S-TMSI-r15,

establishmentCause-r16 ENUMERATED {mo-Data, spare3, spare2, spare1},

dedicatedInfoNAS-r16 DedicatedInfoNAS,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

| *RRCEarlyDataRequest* field descriptions |
| --- |
| ***establishmentCause***  Provides the establishment cause for the RRC Early Data Request as provided by the upper layers. W.r.t. the cause value names: 'mo' stands for 'Mobile Originating'. eNB is not expected to reject a *RRCEarlyDataRequest* due to unknown cause value being used by the UE. If *establishmentCause-v1610* is included, E-UTRAN ignores *establishmentCause-r15*. |

#### – *SCGFailureInformation*

The *SCGFailureInformation* message is used to provide information regarding E-UTRA SCG failures detected by the UE.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E‑UTRAN

*SCGFailureInformation message*

-- ASN1START

SCGFailureInformation-r12 ::= SEQUENCE {

criticalExtensions CHOICE {

c1 CHOICE {

scgFailureInformation-r12 SCGFailureInformation-r12-IEs,

spare3 NULL, spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

SCGFailureInformation-r12-IEs ::= SEQUENCE {

failureReportSCG-r12 FailureReportSCG-r12 OPTIONAL,

nonCriticalExtension SCGFailureInformation-v12d0a-IEs OPTIONAL

}

SCGFailureInformation-v12d0a-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING (CONTAINING SCGFailureInformation-v12d0b-IEs) OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- Late non-critical extensions:

SCGFailureInformation-v12d0b-IEs ::= SEQUENCE {

failureReportSCG-v12d0 FailureReportSCG-v12d0 OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- Regular non-critical extensions:

FailureReportSCG-r12 ::= SEQUENCE {

failureType-r12 ENUMERATED {t313-Expiry, randomAccessProblem,

rlc-MaxNumRetx, scg-ChangeFailure },

measResultServFreqList-r12 MeasResultServFreqList-r10 OPTIONAL,

measResultNeighCells-r12 MeasResultList2EUTRA-r9 OPTIONAL,

...,

[[ failureType-v1290 ENUMERATED {maxUL-TimingDiff-v1290} OPTIONAL

]],

[[ measResultServFreqListExt-r13 MeasResultServFreqListExt-r13 OPTIONAL

]]

}

FailureReportSCG-v12d0 ::= SEQUENCE {

measResultNeighCells-v12d0 MeasResultList2EUTRA-v9e0 OPTIONAL

}

-- ASN1STOP

#### – *SCGFailureInformationNR*

The *SCGFailureInformationNR* message is used to provide information regarding NR SCG failures detected by the UE.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E‑UTRAN

*SCGFailureInformationNR message*

-- ASN1START

SCGFailureInformationNR-r15 ::= SEQUENCE {

criticalExtensions CHOICE {

c1 CHOICE {

scgFailureInformationNR-r15 SCGFailureInformationNR-r15-IEs,

spare3 NULL, spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

SCGFailureInformationNR-r15-IEs ::= SEQUENCE {

failureReportSCG-NR-r15 FailureReportSCG-NR-r15 OPTIONAL,

nonCriticalExtension SCGFailureInformationNR-v1590-IEs OPTIONAL

}

SCGFailureInformationNR-v1590-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

FailureReportSCG-NR-r15 ::= SEQUENCE {

failureType-r15 ENUMERATED {

t310-Expiry, randomAccessProblem,

rlc-MaxNumRetx,

synchReconfigFailureSCG, scg-reconfigFailure,

srb3-IntegrityFailure, dummy},

measResultFreqListNR-r15 MeasResultFreqListFailNR-r15 OPTIONAL,

measResultSCG-r15 OCTET STRING OPTIONAL,

...,

[[ locationInfo-r16 LocationInfo-r10 OPTIONAL,

logMeasResultListBT-r16 LogMeasResultListBT-r15 OPTIONAL,

logMeasResultListWLAN-r16 LogMeasResultListWLAN-r15 OPTIONAL,

failureType-v1610 ENUMERATED {t312-Expiry, scg-lbtFailure,

beamFailureRecoveryFailure, bh-RLF-r16,

beamFailure-r17,

spare3, spare2, spare1} OPTIONAL

]]

}

MeasResultFreqListFailNR-r15 ::= SEQUENCE (SIZE (1..maxFreqNR-r15)) OF MeasResultFreqFailNR-r15

MeasResultFreqFailNR-r15 ::= SEQUENCE {

carrierFreq-r15 ARFCN-ValueNR-r15,

measResultCellList-r15 MeasResultCellListNR-r15 OPTIONAL,

...

}

-- ASN1STOP

| *SCGFailureInformationNR* field descriptions |
| --- |
| ***failureType***  Indicates the cause of the SCG failure. When the field *failureType-v1610* is included, the network ignores the field *failureType-r15*. |
| ***measResultFreqListNR***  The field contains available results of measurements on NR frequencies the UE is configured to measure by *measConfig*. |
| ***measResultSCG***  Includes the NR *MeasResultSCG-Failure* IE as specified in TS 38.331 [82]. The field contains available results of measurements on NR frequencies the UE is configured to measure by the NR RRCConfiguration message. |

#### – *SCPTMConfiguration*

The *SCPTMConfiguration* message contains the control information applicable for MBMS services transmitted via SC-MRB.

Signalling radio bearer: N/A

RLC-SAP: UM

Logical channel: SC-MCCH

Direction: E‑UTRAN to UE

*SCPTMConfiguration message*

-- ASN1START

SCPTMConfiguration-r13 ::= SEQUENCE {

sc-mtch-InfoList-r13 SC-MTCH-InfoList-r13,

scptm-NeighbourCellList-r13 SCPTM-NeighbourCellList-r13 OPTIONAL, -- Need OP

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SCPTMConfiguration-v1340 OPTIONAL

}

SCPTMConfiguration-v1340 ::= SEQUENCE {

p-b-r13 INTEGER (0..3) OPTIONAL, -- Need ON

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

| ***SCPTMConfiguration* field descriptions** |
| --- |
| ***sc-mtch-InfoList***  Provides the configuration of each SC-MTCH in the current cell. |
| ***scptm-NeighbourCellList***  List of neighbour cells providing MBMS services via SC-MRB. When absent, the UE shall assume that MBMS services listed in the *SCPTMConfiguration* message are not provided via SC-MRB in any neighbour cell. |
| *p-b*  Parameter:  for the PDSCH scrambled by G-RNTI, see TS 36.213 [23], Table 5.2-1. |

#### – *SCPTMConfiguration-BR*

The *SCPTMConfiguration-BR* message contains the control information applicable for MBMS services transmitted via SC-MRB for BL UEs or UEs in CE.

Signalling radio bearer: N/A

RLC-SAP: UM

Logical channel: SC-MCCH

Direction: E‑UTRAN to UE

*SCPTMConfiguration-BR message*

-- ASN1START

SCPTMConfiguration-BR-r14 ::= SEQUENCE {

sc-mtch-InfoList-r14 SC-MTCH-InfoList-BR-r14,

scptm-NeighbourCellList-r14 SCPTM-NeighbourCellList-r13 OPTIONAL, -- Need OP

p-b-r14 INTEGER (0..3) OPTIONAL, -- Need OR

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SCPTMConfiguration-BR-v1610 OPTIONAL

}

SCPTMConfiguration-BR-v1610 ::= SEQUENCE {

sc-MTCH-InfoList-MultiTB-r16 SC-MTCH-InfoList-BR-r14,

multiTB-Gap-r16 ENUMERATED {sf2, sf4, sf8, sf16, sf32, sf64, sf128, spare}

OPTIONAL, -- Need OR

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

| *SCPTMConfiguration-BR field descriptions* |
| --- |
| ***p-b***  Parameter:  for the PDSCH scrambled by G-RNTI, see TS 36.213 [23], Table 5.2-1. |
| ***multiTB-Gap***  Indicates scheduling gaps in sub-frames for SC-MTCH using multi-TB scheduling. Value sf2 corresponds to 2 sub-frames, value sf4 corresponds to 4 sub-frames and so on. If the field is absent, there is no scheduling gap. |
| ***sc-mtch-InfoList***  Provides the configuration of each SC-MTCH not using multi-TB scheduling in the current cell for BL UEs or UEs in CE. |
| ***sc-MTCH-InfoList-MultiTB***  Provides the configuration of each SC-MTCH using multi-TB scheduling in the current cell for BL UEs or UEs in CE. When this field is included, the total number of SC-MTCH configurations in *sc-mtch-InfoList* and *sc-MTCH-InfoList-MultiTB* cannot be more than *maxSC-MTCH-BR-r14*. |
| ***scptm-NeighbourCellList***  List of neighbour cells providing MBMS services via SC-MRB. When absent, the BL UE or UE in CE shall assume that MBMS services listed in the *SCPTMConfiguration-BR* message are not provided via SC-MRB in any neighbour cell. |

#### – *SecurityModeCommand*

The *SecurityModeCommand* message is used to command the activation of AS security.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: E‑UTRAN to UE

*SecurityModeCommand message*

-- ASN1START

SecurityModeCommand ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

c1 CHOICE{

securityModeCommand-r8 SecurityModeCommand-r8-IEs,

spare3 NULL, spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

SecurityModeCommand-r8-IEs ::= SEQUENCE {

securityConfigSMC SecurityConfigSMC,

nonCriticalExtension SecurityModeCommand-v8a0-IEs OPTIONAL

}

SecurityModeCommand-v8a0-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

SecurityConfigSMC ::= SEQUENCE {

securityAlgorithmConfig SecurityAlgorithmConfig,

...

}

-- ASN1STOP

#### – *SecurityModeComplete*

The *SecurityModeComplete* message is used to confirm the successful completion of a security mode command.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E‑UTRAN

*SecurityModeComplete message*

-- ASN1START

SecurityModeComplete ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

securityModeComplete-r8 SecurityModeComplete-r8-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

SecurityModeComplete-r8-IEs ::= SEQUENCE {

nonCriticalExtension SecurityModeComplete-v8a0-IEs OPTIONAL

}

SecurityModeComplete-v8a0-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

#### – *SecurityModeFailure*

The *SecurityModeFailure* message is used to indicate an unsuccessful completion of a security mode command.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E‑UTRAN

*SecurityModeFailure message*

-- ASN1START

SecurityModeFailure ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

securityModeFailure-r8 SecurityModeFailure-r8-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

SecurityModeFailure-r8-IEs ::= SEQUENCE {

nonCriticalExtension SecurityModeFailure-v8a0-IEs OPTIONAL

}

SecurityModeFailure-v8a0-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

#### – *SidelinkUEInformation*

The *SidelinkUEInformation* message is used for the indication of sidelink information to the eNB.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E‑UTRAN

*SidelinkUEInformation message*

-- ASN1START

SidelinkUEInformation-r12 ::= SEQUENCE {

criticalExtensions CHOICE {

c1 CHOICE {

sidelinkUEInformation-r12 SidelinkUEInformation-r12-IEs,

spare3 NULL, spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

SidelinkUEInformation-r12-IEs ::= SEQUENCE {

commRxInterestedFreq-r12 ARFCN-ValueEUTRA-r9 OPTIONAL,

commTxResourceReq-r12 SL-CommTxResourceReq-r12 OPTIONAL,

discRxInterest-r12 ENUMERATED {true} OPTIONAL,

discTxResourceReq-r12 INTEGER (1..63) OPTIONAL,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SidelinkUEInformation-v1310-IEs OPTIONAL

}

SidelinkUEInformation-v1310-IEs ::= SEQUENCE {

commTxResourceReqUC-r13 SL-CommTxResourceReq-r12 OPTIONAL,

commTxResourceInfoReqRelay-r13 SEQUENCE {

commTxResourceReqRelay-r13 SL-CommTxResourceReq-r12 OPTIONAL,

commTxResourceReqRelayUC-r13 SL-CommTxResourceReq-r12 OPTIONAL,

ue-Type-r13 ENUMERATED {relayUE, remoteUE}

} OPTIONAL,

discTxResourceReq-v1310 SEQUENCE {

carrierFreqDiscTx-r13 INTEGER (1..maxFreq) OPTIONAL,

discTxResourceReqAddFreq-r13 SL-DiscTxResourceReqPerFreqList-r13 OPTIONAL

} OPTIONAL,

discTxResourceReqPS-r13 SL-DiscTxResourceReq-r13 OPTIONAL,

discRxGapReq-r13 SL-GapRequest-r13 OPTIONAL,

discTxGapReq-r13 SL-GapRequest-r13 OPTIONAL,

discSysInfoReportFreqList-r13 SL-DiscSysInfoReportFreqList-r13 OPTIONAL,

nonCriticalExtension SidelinkUEInformation-v1430-IEs OPTIONAL

}

SidelinkUEInformation-v1430-IEs ::= SEQUENCE {

v2x-CommRxInterestedFreqList-r14 SL-V2X-CommFreqList-r14 OPTIONAL,

p2x-CommTxType-r14 ENUMERATED {true} OPTIONAL,

v2x-CommTxResourceReq-r14 SL-V2X-CommTxFreqList-r14 OPTIONAL,

nonCriticalExtension SidelinkUEInformation-v1530-IEs OPTIONAL

}

SidelinkUEInformation-v1530-IEs ::= SEQUENCE {

reliabilityInfoListSL-r15 SL-ReliabilityList-r15 OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

SL-CommTxResourceReq-r12 ::= SEQUENCE {

carrierFreq-r12 ARFCN-ValueEUTRA-r9 OPTIONAL,

destinationInfoList-r12 SL-DestinationInfoList-r12

}

SL-DiscTxResourceReqPerFreqList-r13 ::= SEQUENCE (SIZE (1..maxFreq)) OF SL-DiscTxResourceReq-r13

SL-DiscTxResourceReq-r13 ::= SEQUENCE {

carrierFreqDiscTx-r13 INTEGER (1..maxFreq) OPTIONAL,

discTxResourceReq-r13 INTEGER (1..63)

}

SL-DestinationInfoList-r12 ::= SEQUENCE (SIZE (1..maxSL-Dest-r12)) OF SL-DestinationIdentity-r12

SL-DestinationIdentity-r12 ::= BIT STRING (SIZE (24))

SL-DiscSysInfoReportFreqList-r13 ::= SEQUENCE (SIZE (1.. maxSL-DiscSysInfoReportFreq-r13)) OF SL-DiscSysInfoReport-r13

SL-V2X-CommFreqList-r14 ::= SEQUENCE (SIZE (1..maxFreqV2X-r14)) OF INTEGER (0..maxFreqV2X-1-r14)

SL-V2X-CommTxFreqList-r14 ::= SEQUENCE (SIZE (1..maxFreqV2X-r14)) OF SL-V2X-CommTxResourceReq-r14

SL-V2X-CommTxResourceReq-r14 ::= SEQUENCE {

carrierFreqCommTx-r14 INTEGER (0.. maxFreqV2X-1-r14) OPTIONAL,

v2x-TypeTxSync-r14 SL-TypeTxSync-r14 OPTIONAL,

v2x-DestinationInfoList-r14 SL-DestinationInfoList-r12 OPTIONAL

}

-- ASN1STOP

| *SidelinkUEInformation* field descriptions |
| --- |
| ***carrierFreqCommTx***  Indicates the index of the frequency on which the UE is interested to transmit V2X sidelink communication. The value 1 corresponds to the frequency of first entry in *v2x-InterFreqInfoList* broadcast in SIB21, the value 2 corresponds to the frequency of second entry in *v2x-InterFreqInfoList* broadcast in SIB21 and so on. If SIB26 is broadcast and the number of entries included in *v2x-InterFreqInfoList* of SIB21 is N*,* the value N+1 corresponds to the frequency of the first entry which is included in *v2x-InterFreqInfoList* broadcast in SIB26 and has a frequency not included in SIB21, the value N+2 corresponds to the frequency of the second entry which is included in *v2x-InterFreqInfoList* broadcast in SIB26 and has a frequency not included in SIB21, and so on. The value 0 corresponds the PCell's frequency. |
| ***carrierFreqDiscTx***  Indicates the frequency by the index of the entry in field *discInterFreqList* within *SystemInformationBlockType19*. Value 1 corresponds to the first entry in *discInterFreqList* within *SystemInformationBlockType19*, value 2 corresponds to the second entry in this list and so on. |
| ***commRxInterestedFreq***  Indicates the frequency on which the UE is interested to receive sidelink communication. |
| ***commTxResourceReq***  Indicates the frequency on which the UE is interested to transmit non-relay related sidelink communication as well as the one-to-many sidelink communication transmission destination(s) for which the UE requests E-UTRAN to assign dedicated resources. NOTE 1. |
| ***commTxResourceReqRelay***  Indicates the relay related one-to-many sidelink communication transmission destination(s) for which the sidelink relay UE requests E-UTRAN to assign dedicated resources. |
| ***commTxResourceReqRelayUC***  Indicates the relay related one-to-one sidelink communication transmission destination(s) for which the sidelink relay UE or sidelink remote UE requests E-UTRAN to assign dedicated resources i.e. either contains the unicast destination identity of the sidelink relay UE or of the sidelink remote UE. |
| ***commTxResourceReqUC***  Indicates the frequency on which the UE is interested to transmit non-relay related one-to-one sidelink communication as well as the sidelink communication transmission destination(s) for which the UE requests E-UTRAN to assign dedicated resources. NOTE 1. |
| ***destinationInfoList***  Indicates the destination(s) for relay or non-relay related one-to-one or one-to-many sidelink communication. For one-to-one sidelink communication the destination is identified by the ProSe UE ID for unicast communication, while for one-to-many the destination it is identified by the ProSe Layer-2 Group ID as specified in TS 23.303 [68]. |
| ***discRxInterest***  Indicates that the UE is interested to monitor sidelink discovery announcements. |
| ***discSysInfoReportFreqList***  Indicates, for one or more frequencies, a list of sidelink discovery related parameters acquired from system Information of cells on configured inter-frequency carriers. |
| ***discTxResourceReq***  Indicates the number of separate discovery message(s) the UE wants to transmit every discovery period. This field concerns the resources the UE requires every discovery period for transmitting sidelink discovery announcement(s). |
| ***discTxResourceReqAddFreq***  Indicates, for any frequencies in addition to the one covered by *discTxResourceReq*, the number of separate discovery message(s) the UE wants to transmit every discovery period. This field concerns the resources the UE requires every discovery period for transmitting sidelink discovery announcement(s). |
| ***discTxResourceReqPS***  Indicates the number of separate PS related discovery message(s) the UE wants to transmit every discovery period. This field concerns the resources the UE requires every discovery period for transmitting PS related sidelink discovery announcement(s). |
| ***p2x-CommTxType***  Indicates that the requested transmission resource pool is for P2X related V2X sidelink communication. |
| ***reliabilityInfoListSL***  Indicates the reliability(ies) (i.e., PPPRs as specified in TS 36.300 [9]), associated with the reported traffic to be transmitted for V2X sidelink communication. |
| ***v2x-CommRxInterestedFreqList***  Indicates the index(es) of the frequency(ies) on which the UE is interested to receive V2X sidelink communication. The value 1 corresponds to the frequency of first entry in *v2x-InterFreqInfoList* broadcast in SIB21, the value 2 corresponds to the frequency of second entry in *v2x-InterFreqInfoList* broadcast in SIB21 and so on. If SIB26 is broadcast and the number of entries included in *v2x-InterFreqInfoList* of SIB21 is N*,* the value N+1 corresponds to the frequency of the first entry which is included in *v2x-InterFreqInfoList* broadcast in SIB26 and has a frequency not included in SIB21, the value N+2 corresponds to the frequency of the second entry which is included in *v2x-InterFreqInfoList* broadcast in SIB26 and has a frequency not included in SIB21, and so on. The value 0 corresponds the PCell's frequency. |
| ***v2x-DestinationInfoList***  Indicates the destination(s) for V2X sidelink communication. |
| ***v2x-TypeTxSync***  Indicates the synchronization reference used by the UE. |

NOTE 1: When configuring *commTxResourceReq*, *commTxResourceReqUC*, *commTxResourceReqRelay* and *commTxResourceReqRelayUC*, E-UTRAN configures at most *maxSL-Dest-r12* destinations in total (i.e. as included in the four fields together).

#### – *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,

sib26a-v1610 SystemInformationBlockType26a-r16,

sib27-v1610 SystemInformationBlockType27-r16,

sib28-v1610 SystemInformationBlockType28-r16,

sib29-v1610 SystemInformationBlockType29-r16,

sib30-v1700 SystemInformationBlockType30-r17,

sib31-v1700 SystemInformationBlockType31-r17,

sib32-v1700 SystemInformationBlockType32-r17

},

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,

...,

[[

posSib1-8-v1610 SystemInformationBlockPos-r15,

posSib2-20-v1610 SystemInformationBlockPos-r15,

posSib2-21-v1610 SystemInformationBlockPos-r15,

posSib2-22-v1610 SystemInformationBlockPos-r15,

posSib2-23-v1610 SystemInformationBlockPos-r15,

posSib2-24-v1610 SystemInformationBlockPos-r15,

posSib2-25-v1610 SystemInformationBlockPos-r15,

posSib4-1-v1610 SystemInformationBlockPos-r15,

posSib5-1-v1610 SystemInformationBlockPos-r15

]],

[[

posSib1-9-v1700 SystemInformationBlockPos-r15,

posSib1-10-v1700 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 SystemInformationBlockType1-v10x0-IEs OPTIONAL

}

SystemInformationBlockType1-v10x0-IEs ::= SEQUENCE {

-- This field is only for late non-critical extensions from Rel-10 or Rel-11 onwards

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SystemInformationBlockType1-v12j0-IEs OPTIONAL

}

SystemInformationBlockType1-v12j0-IEs ::= SEQUENCE {

schedulingInfoList-v12j0 SchedulingInfoList-v12j0 OPTIONAL, -- Need OR

schedulingInfoListExt-r12 SchedulingInfoListExt-r12 OPTIONAL, -- Need OR

nonCriticalExtension SystemInformationBlockType1-v15g0-IEs OPTIONAL

}

SystemInformationBlockType1-v15g0-IEs ::= SEQUENCE {

bandwidthReducedAccessRelatedInfo-v15g0 SEQUENCE {

posSchedulingInfoList-BR-r15 SchedulingInfoList-BR-r13

} 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 NULL,

crs-IntfMitigNumPRBs 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-v1610-IEs OPTIONAL

}

SystemInformationBlockType1-v1610-IEs ::= SEQUENCE {

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

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

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

plmn-IdentityList-v1610 PLMN-IdentityList-v1610 OPTIONAL, -- Need OR

nonCriticalExtension SystemInformationBlockType1-v1700-IEs OPTIONAL

}

SystemInformationBlockType1-v1700-IEs ::= SEQUENCE {

cellAccessRelatedInfo-NTN-r17 SEQUENCE {

cellBarred-NTN-r17 ENUMERATED {barred, notBarred},

plmn-IdentityList-v1700 PLMN-IdentityList-v1700 OPTIONAL -- Need OR

} 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-v1610::= SEQUENCE (SIZE (1..maxPLMN-r11)) OF PLMN-IdentityInfo-v1610

PLMN-IdentityList-v1700::= SEQUENCE (SIZE (1..maxPLMN-r11)) OF PLMN-IdentityInfo-v1700

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-v1610 ::= SEQUENCE {

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

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

iab-Support-r16 ENUMERATED {true} OPTIONAL -- Need OR

}

PLMN-IdentityInfo-v1700 ::= SEQUENCE {

trackingAreaList-r17 TrackingAreaList-r17 OPTIONAL -- Need OP

}

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

SchedulingInfoList-v12j0 ::= SEQUENCE (SIZE (1..maxSI-Message)) OF SchedulingInfo-v12j0

SchedulingInfoListExt-r12 ::= SEQUENCE (SIZE (1..maxSI-Message)) OF SchedulingInfoExt-r12

SchedulingInfo ::= SEQUENCE {

si-Periodicity SI-Periodicity-r12,

sib-MappingInfo SIB-MappingInfo

}

SchedulingInfo-v12j0 ::= SEQUENCE {

sib-MappingInfo-v12j0 SIB-MappingInfo-v12j0 OPTIONAL -- Need OR

}

SchedulingInfoExt-r12 ::= SEQUENCE {

si-Periodicity-r12 SI-Periodicity-r12,

sib-MappingInfo-r12 SIB-MappingInfo-v12j0

}

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-MappingInfo-v12j0 ::= SEQUENCE (SIZE (1..maxSIB-1)) OF SIB-Type-v12j0

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,

sibType26a-v1610, sibType27-v1610, sibType28-v1610,

sibType29-v1610, sibType30-v1700, sibType31-v1700, sibType32-v1700}

SIB-Type-v12j0 ::= ENUMERATED {

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

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

sibType26a-v1610, sibType27-v1610, sibType28-v1610,

sibType29-v1610, sibType30-v1700, sibType31-v1700, sibType32-v1700,

spare3, spare2, spare1, ...}

SI-Periodicity-r12 ::= ENUMERATED {rf8, rf16, rf32, rf64, rf128, rf256, rf512}

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)

}

TrackingAreaList-r17 ::= SEQUENCE (SIZE (1..maxTAC-r17)) OF TrackingAreaCode

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-v1610,

posSibType2-20-v1610,

posSibType2-21-v1610,

posSibType2-22-v1610,

posSibType2-23-v1610,

posSibType2-24-v1610,

posSibType2-25-v1610,

posSibType4-1-v1610,

posSibType5-1-v1610,

posSibType1-9-v1700,

posSibType1-10-v1700

},

...

}

-- ASN1STOP

| *SystemInformationBlockType1* field descriptions |
| --- |
| ***bandwithReducedAccessRelatedInfo***  Access related information for BL UEs and UEs in CE. NOTE 3. |
| ***campingAllowedInCE***  Indicates whether non-BL UE is allowed to camp in the non-standalone BL cell in enhanced coverage mode when S-criterion for normal coverage is fulfilled. The field is not applicable for standalone BL cell. |
| ***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]. |
| ***cellBarred-NTN***  barred means the cell is barred for connectivity to NTN, as defined in TS 36.304 [4].  E-UTRAN always includes *cellBarred-NTN* and sets *cellBarred* to ‘barred’ in an NTN cell. | |
| ***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***  Indicates whether 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 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 cell (re)selection 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-v1610* is included, E-UTRAN includes the same number of entries, and listed in the same order, as in *plmn-IdentityList-r15*. If *plmn-IdentityList-v1700* is included, E-UTRAN includes the same number of entries, and listed in the same order, as in *plmn-IdentityList* (without suffix). 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. This field is ignored by IAB-MT. The IAB-MT applies output power and emissions requirements, as specified in TS 38.174 [107]. |
| ***posSchedulingInfoList-BR***  Indicates additional scheduling information of positioning SI messages for BL UEs and UEs in CE. E-UTRAN always includes this field if *posSchedulingInfoList-r15* is included in *SystemInformationBlockType1-BR*, and includes the same number of entries, and listed in the same order, as in *posSchedulingInfoList-r15*. |
| ***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. |
| ***schedulingInfoList***  Indicates scheduling information of SI messages. The *schedulingInfoList-v12j0* (if present) provides additional SIBs mapped into the SI message scheduled via *schedulingInfoList* (without suffix). If E-UTRAN includes *schedulingInfoList-v12j0*, it includes the same number of entries, and listed in the same order, as in *schedulingInfoList* (without suffix). |
| ***schedulingInfoListExt***  Indicates scheduling information of additional SI messages. The UE concatenates the entries of *schedulingInfoListExt* to the entries in *schedulingInfoList*, according to the general concatenation principles for list extension as defined in 5.1.2. If the *schedulingInfoListExt* is present, E-UTRAN ensures that the total number of entries of this field plus *schedulingInfoList* (without suffix) shall not exceed the value of *maxSI-Message*. |
| ***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* (without suffix) list. If present, *sib-MappingInfo-v12j0* indicates one or more additional SIBs mapped to the concerned SI message listed in the *schedulingInfoList* (without suffix) list. If *schedulingInfoList-v12j0* or *schedulingInfoListExt-r12* is present, E-UTRAN does not include any value indicating SIB of type 19 or higher in *sib-MappingInfo* (without suffix). If *schedulingInfoList-v12j0* is present, E-UTRAN ensures that the total number of entries of this field plus *sib-MappingInfo* (without suffix) shall not exceed the value of *maxSIB-1*. |
| ***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, SIB14 and SIB31. |
| ***systemInfoValueTag***  Common for all SIBs other than MIB, MIB-MBMS, SIB1, SIB1-MBMS, SIB10, SIB11, SIB12, SIB14 and SIB31. 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. |
| ***trackingAreaList***  A list of tracking area codes for the PLMN listed.  For the first entry in *plmn-IdentityList-v1700*: If this field is present,thelist oftracking area codes include the tracking area code in *trackingAreaCode*(without suffix) andthe tracking area codesin *trackingAreaList*. If this field is absent, *trackingAreaCode* (without suffix) applies.  For other entries in *plmn-IdentityList-v1700*: If this field is present,thelist oftracking area codes include the tracking area codesin *trackingAreaList*. If this field is absent, the list of tracking area codes of the preceding entry in *plmn-IdentityList-v1700* applies.  The total number of signalled tracking area codes across all PLMNs cannot be more than *maxTAC-r17*. | |
| ***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***  Indicates whether 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. |

#### – *SystemInformationBlockType1-MBMS*

*SystemInformationBlockType1-MBMS* contains information relevant for receiving service from MBMS-dedicated cell and defines the scheduling of other system information.

Signalling radio bearer: N/A

RLC-SAP: TM

Logical channels: BCCH

Direction: E‑UTRAN to UE

*SystemInformationBlockType1-MBMS message*

-- ASN1START

SystemInformationBlockType1-MBMS-r14 ::= SEQUENCE {

cellAccessRelatedInfo-r14 SEQUENCE {

plmn-IdentityList-r14 PLMN-IdentityList-MBMS-r14,

trackingAreaCode-r14 TrackingAreaCode,

cellIdentity-r14 CellIdentity

},

freqBandIndicator-r14 FreqBandIndicator-r11,

multiBandInfoList-r14 MultiBandInfoList-r11 OPTIONAL, -- Need OR

schedulingInfoList-MBMS-r14 SchedulingInfoList-MBMS-r14,

si-WindowLength-r14 ENUMERATED {

ms1, ms2, ms5, ms10, ms15, ms20,ms40, ms80},

systemInfoValueTag-r14 INTEGER (0..31),

nonMBSFN-SubframeConfig-r14 NonMBSFN-SubframeConfig-r14 OPTIONAL, --Need OR

pdsch-ConfigCommon-r14 PDSCH-ConfigCommon,

systemInformationBlockType13-r14 SystemInformationBlockType13-r9 OPTIONAL, --Need OR

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

CellAccessRelatedInfo-r14 OPTIONAL, -- Need OR

nonCriticalExtension SEQUENCE {} OPTIONAL

}

PLMN-IdentityList-MBMS-r14 ::= SEQUENCE (SIZE (1..maxPLMN-r11)) OF PLMN-Identity

SchedulingInfoList-MBMS-r14 ::= SEQUENCE (SIZE (1..maxSI-Message)) OF SchedulingInfo-MBMS-r14

SchedulingInfo-MBMS-r14 ::= SEQUENCE {

si-Periodicity-r14 ENUMERATED {

rf16, rf32, rf64, rf128, rf256, rf512},

sib-MappingInfo-r14 SIB-MappingInfo-MBMS-r14

}

SIB-MappingInfo-MBMS-r14 ::= SEQUENCE (SIZE (0..maxSIB-1)) OF SIB-Type-MBMS-r14

SIB-Type-MBMS-r14 ::= ENUMERATED {

sibType10, sibType11, sibType12-v920, sibType13-v920,

sibType15-v1130, sibType16-v1130, ...}

NonMBSFN-SubframeConfig-r14 ::= SEQUENCE {

radioFrameAllocationPeriod-r14 ENUMERATED {rf4, rf8, rf16, rf32, rf64, rf128, rf512},

radioFrameAllocationOffset-r14 INTEGER (0..7),

subframeAllocation-r14 BIT STRING (SIZE(9))

}

-- ASN1STOP

| *SystemInformationBlockType1-MBMS* field descriptions |
| --- |
| ***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 2. |
| ***cellIdentity***  Indicates the cell identity. NOTE 1. |
| ***freqBandIndicator***  A list of as defined in TS 36.101 [42], table 6.2.4-1, for the frequency band in *freqBandIndicator*. |
| ***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. |
| ***nonMBSFN-SubframeConfig***  Defines the non-MBSFN subframes within the radio frame allocation period defined by the *radioFrameAllocationPeriod* and the *radioFrameAllocationOffset.* |
| ***plmn-IdentityList***  List of PLMN identities. The first listed *PLMN-Identity* is the primary PLMN.NOTE 1. |
| ***radioFrameAllocationPeriod, radioFrameAllocationOffset***  Radio-frames that contain non-MBSFN subframes occur when equation *SFN* mod *radioFrameAllocationPeriod* = *radioFrameAllocationOffset*is satisfied. Value rf4 for *radioframeAllocationPeriod* denotes 4 radio frames, rf8 detones 8 radion frames, and so on. |
| ***schedulingInfoList-MBMS***  Indicates additional scheduling information of SI messages on MBMS-dedicated cell. |
| ***sib-MappingInfo***  List of the SIBs mapped to this *SystemInformation* message. |
| ***si-Periodicity***  Periodicity of the SI-message in radio frames, such that rf16 denotes 16 radio frames, rf32 denotes 32 radio frames, and so on. |
| ***si-WindowLength***  Common SI scheduling window for all SIs. Unit in milliseconds, where ms1 denotes 1 millisecond, ms2 denotes 2 milliseconds and so on. |
| ***subframeAllocation***  Defines the subframes that are allocated for non-MBSFN within the radio frame allocation period defined by the radioFrameAllocationPeriod and the radioFrameAllocationOffset. "0" denotes that the corresponding subframe is a MBSFN subframe*.* "1" denotes that the corresponding subframe is a non-MBSFN subframe. If E-UTRAN configures a value other than "0" for *additionalNonMBSFNSubframes* within *MasterInformationBlock-MBMS,* *subframeAllocation* configuration should also indicate subframes pointed out by *additionalNonMBSFNSubframes* as non-MBSFN subframes*.* |
| ***systemInformationBlockType13***  E-UTRAN does not configure this field if *schedulingInfoList–MBMS* indicates that *SystemInformationBlockType13* is present. |
| ***systemInfoValueTag***  Common for all SIBs other than MIB, SIB1, SIB10, SIB11, SIB12 and SIB14. Change of MIB and SIB1 is detected by acquisition of the corresponding message. |
| ***trackingAreaCode***  A *trackingAreaCode* that is common for all the PLMNs listed. NOTE1. |

NOTE 1: E-UTRAN sets this field to the same value for all instances of SIB1-MBMS message that are broadcasted within the same cell.

#### – *UEAssistanceInformation*

The *UEAssistanceInformation* message is used for the indication of UE assistance information to the eNB.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E‑UTRAN

*UEAssistanceInformation message*

-- ASN1START

UEAssistanceInformation-r11 ::= SEQUENCE {

criticalExtensions CHOICE {

c1 CHOICE {

ueAssistanceInformation-r11 UEAssistanceInformation-r11-IEs,

spare3 NULL, spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

UEAssistanceInformation-r11-IEs ::= SEQUENCE {

powerPrefIndication-r11 ENUMERATED {normal, lowPowerConsumption} OPTIONAL,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension UEAssistanceInformation-v1430-IEs OPTIONAL

}

UEAssistanceInformation-v1430-IEs ::= SEQUENCE {

bw-Preference-r14 BW-Preference-r14 OPTIONAL,

sps-AssistanceInformation-r14 SEQUENCE {

trafficPatternInfoListSL-r14 TrafficPatternInfoList-r14 OPTIONAL,

trafficPatternInfoListUL-r14 TrafficPatternInfoList-r14 OPTIONAL

} OPTIONAL,

rlm-Report-r14 SEQUENCE {

rlm-Event-r14 ENUMERATED {earlyOutOfSync, earlyInSync},

excessRep-MPDCCH-r14 ENUMERATED {excessRep1, excessRep2} OPTIONAL

} OPTIONAL,

delayBudgetReport-r14 DelayBudgetReport-r14 OPTIONAL,

nonCriticalExtension UEAssistanceInformation-v1450-IEs OPTIONAL

}

UEAssistanceInformation-v1450-IEs ::= SEQUENCE {

overheatingAssistance-r14 OverheatingAssistance-r14 OPTIONAL,

nonCriticalExtension UEAssistanceInformation-v1530-IEs OPTIONAL

}

UEAssistanceInformation-v1530-IEs ::= SEQUENCE {

sps-AssistanceInformation-v1530 SEQUENCE {

trafficPatternInfoListSL-v1530 TrafficPatternInfoList-v1530

} OPTIONAL,

nonCriticalExtension UEAssistanceInformation-v1610-IEs OPTIONAL

}

UEAssistanceInformation-v1610-IEs ::= SEQUENCE {

overheatingAssistance-v1610 OverheatingAssistance-v1610 OPTIONAL,

nonCriticalExtension UEAssistanceInformation-v1700-IEs OPTIONAL

}

UEAssistanceInformation-v1700-IEs ::= SEQUENCE {

uplinkData-r17 ENUMERATED { true } OPTIONAL,

scg-DeactivationPreference-r17 ENUMERATED { scgDeactivationPreferred,

noPreference } OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

BW-Preference-r14 ::= SEQUENCE {

dl-Preference-r14 ENUMERATED {mhz1dot4, mhz5, mhz20 } OPTIONAL,

ul-Preference-r14 ENUMERATED {mhz1dot4, mhz5} OPTIONAL

}

TrafficPatternInfoList-r14 ::= SEQUENCE (SIZE (1..maxTrafficPattern-r14)) OF TrafficPatternInfo-r14

TrafficPatternInfo-r14 ::= SEQUENCE {

trafficPeriodicity-r14 ENUMERATED {

sf20, sf50, sf100, sf200, sf300, sf400, sf500,

sf600, sf700, sf800, sf900, sf1000},

timingOffset-r14 INTEGER (0..10239),

priorityInfoSL-r14 SL-Priority-r13 OPTIONAL,

logicalChannelIdentityUL-r14 INTEGER (3..10) OPTIONAL,

messageSize-r14 BIT STRING (SIZE (6))

}

TrafficPatternInfoList-v1530 ::= SEQUENCE (SIZE (1..maxTrafficPattern-r14)) OF TrafficPatternInfo-v1530

TrafficPatternInfo-v1530 ::= SEQUENCE {

trafficDestination-r15 SL-DestinationIdentity-r12 OPTIONAL,

reliabilityInfoSL-r15 SL-Reliability-r15 OPTIONAL

}

DelayBudgetReport-r14::= CHOICE {

type1 ENUMERATED {

msMinus1280, msMinus640, msMinus320, msMinus160,

msMinus80, msMinus60, msMinus40, msMinus20, ms0, ms20,

ms40, ms60, ms80, ms160, ms320, ms640, ms1280},

type2 ENUMERATED {

msMinus192, msMinus168,msMinus144, msMinus120,

msMinus96, msMinus72, msMinus48, msMinus24, ms0, ms24,

ms48, ms72, ms96, ms120, ms144, ms168, ms192}

}

OverheatingAssistance-r14 ::= SEQUENCE {

reducedUE-Category SEQUENCE {

reducedUE-CategoryDL INTEGER (0..19),

reducedUE-CategoryUL INTEGER (0..21)

} OPTIONAL,

reducedMaxCCs SEQUENCE {

reducedCCsDL INTEGER (0..31),

reducedCCsUL INTEGER (0..31)

} OPTIONAL

}

OverheatingAssistance-v1610 ::= SEQUENCE {

overheatingAssistanceForSCG-r16 OCTET STRING

}

-- ASN1STOP

| *UEAssistanceInformation* field descriptions |
| --- |
| ***delayBudgetReport***  Indicates the UE-preferred adjustment to connected mode DRX or coverage enhancement configuration. |
| ***dl-Preference***  Indicates UE's preference on configuration of maximum PDSCH bandwidth. The value mhz1dot4 corresponds to CE mode usage in 1.4MHz bandwidth, mhz5 corresponds to CE mode usage in 5MHz bandwidth, and mhz20 corresponds to CE mode usage in 20MHz bandwidth or normal coverage. |
| ***excessRep-MPDCCH***  Indicates the excess number of repetitions on MPDCCH. Value excessRep1 and excessRep2 indicate the excess number of repetitions defined in TS 36.133 [16]. |
| ***logicalChannelIdentityUL***  Indicates the logical channel identity associated with the reported traffic pattern in the uplink logical channel. |
| ***messageSize***  Indicates the maximum TB size based on the observed traffic pattern. The value refers to the index of TS 36.321 [6], table 6.1.3.1-1. |
| ***overheatingAssistanceForSCG***  Includes the NR *OverheatingAssistance* IE as specified in TS 38.331 [82]. The field indicates UE's preference on reduced configuration for NR SCG to address overheating. |
| ***powerPrefIndication***  Value *lowPowerConsumption* indicates the UE prefers a configuration that is primarily optimised for power saving. Otherwise the value is set to *normal*. |
| ***priorityInfoSL***  Indicates the traffic priority (i.e., PPPP) associated with the reported traffic pattern for V2X sidelink communication. |
| ***reducedCCsDL***  Indicates the UE's preference on reduced configuration corresponding to the maximum number of downlink SCells indicated by the field, to address overheating. This maximum number includes both SCells of E-UTRA and PSCell/SCells of NR in (NG)EN-DC. |
| ***reducedCCsUL***  Indicates the UE's preference on reduced configuration corresponding to the maximum number of uplink SCells indicated by the field, to address overheating. This maximum number includes both SCells of E-UTRA and PSCell/SCells of NR in (NG)EN-DC. |
| ***reducedUE-CategoryDL, reducedUE-CategoryUL***  Indicates that UE prefers a configuration corresponding to the reduced UE category, to address overheating. The reduced UE DL category and reduced UE UL category should be indicated according to supported combinations for UE UL and DL Categories, see TS 36.306 [5], Table 4.1A-6. |
| ***reliabilityInfoSL***  Indicates the traffic reliability (i.e., PPPR) associated with the reported traffic pattern for V2X sidelink communication. |
| ***rlm-Event***  This field provides the RLM event ("early-out-of-sync" or "early-in-sync"). |
| ***rlm-Report***  This field provides the RLM report for BL UEs and UEs in CE. |
| ***sps-AssistanceInformation***  Indicates the UE assistance information to assist E-UTRAN to configure SPS. |
| ***timingOffset***  This field indicates the estimated timing for a packet arrival in a SL/UL logical channel. Specifically, the value indicates the timing offset with respect to subframe#0 of SFN#0 in milliseconds. |
| ***trafficDestination***  Indicates the destination associated with the reported traffic pattern for V2X sidelink communication. |
| ***trafficPatternInfoListSL***  This field provides the traffic characteristics of sidelink logical channel(s) that are setup for V2X sidelink communication. If *trafficPatternInfoListSL-v1530* is included*,* it includes the same number of entries, and listed in the same order, as in*trafficPatternInfoListSL-r14*. |
| ***trafficPatternInfoListUL***  This field provides the traffic characteristics of uplink logical channel(s). |
| ***trafficPeriodicity***  This field indicates the estimated data arrival periodicity in a SL/UL logical channel. Value sf20 corresponds to 20 ms, sf50 corresponds to 50 ms and so on. |
| ***type1***  Indicates the preferred amount of increment/decrement to the connected mode DRX cycle length with respect to the current configuration. Value in number of milliseconds. Value ms40 corresponds to 40 milliseconds, msMinus40 corresponds to -40 milliseconds and so on. |
| ***type2***  Indicates the preferred amount of increment/decrement to the coverage enhancement configuration with respect to the current configuration so that the Uu air interface delay changes by the indicated amount. Value in number of milliseconds. Value ms24 corresponds to 24 milliseconds, msMinus24 corresponds to -24 milliseconds and so on. |
| ***ul-Preference***  Indicates UE's preference on configuration of maximum PUSCH bandwidth. The value mhz1dot4 corresponds to CE mode usage in 1.4MHz bandwidth, and mhz5 corresponds to CE mode usage in 5MHz bandwidth. |

#### – *UECapabilityEnquiry*

The *UECapabilityEnquiry* message is used to request the transfer of UE radio access capabilities for E‑UTRA as well as for other RATs.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: E‑UTRAN to UE

*UECapabilityEnquiry message*

-- ASN1START

UECapabilityEnquiry ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

c1 CHOICE {

ueCapabilityEnquiry-r8 UECapabilityEnquiry-r8-IEs,

spare3 NULL, spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

UECapabilityEnquiry-r8-IEs ::= SEQUENCE {

ue-CapabilityRequest UE-CapabilityRequest,

nonCriticalExtension UECapabilityEnquiry-v8a0-IEs OPTIONAL

}

UECapabilityEnquiry-v8a0-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension UECapabilityEnquiry-v1180-IEs OPTIONAL

}

UECapabilityEnquiry-v1180-IEs ::= SEQUENCE {

requestedFrequencyBands-r11 SEQUENCE (SIZE (1..16)) OF FreqBandIndicator-r11 OPTIONAL,

nonCriticalExtension UECapabilityEnquiry-v1310-IEs OPTIONAL

}

UECapabilityEnquiry-v1310-IEs ::= SEQUENCE {

requestReducedFormat-r13 ENUMERATED {true} OPTIONAL, -- Need ON

requestSkipFallbackComb-r13 ENUMERATED {true} OPTIONAL, -- Need ON

requestedMaxCCsDL-r13 INTEGER (2..32) OPTIONAL, -- Need ON

requestedMaxCCsUL-r13 INTEGER (2..32) OPTIONAL, -- Need ON

requestReducedIntNonContComb-r13 ENUMERATED {true} OPTIONAL, -- Need ON

nonCriticalExtension UECapabilityEnquiry-v1430-IEs OPTIONAL

}

UECapabilityEnquiry-v1430-IEs ::= SEQUENCE {

requestDiffFallbackCombList-r14 BandCombinationList-r14 OPTIONAL, -- Need ON

nonCriticalExtension UECapabilityEnquiry-v1510-IEs OPTIONAL

}

UECapabilityEnquiry-v1510-IEs ::= SEQUENCE {

requestedFreqBandsNR-MRDC-r15 OCTET STRING OPTIONAL,

nonCriticalExtension UECapabilityEnquiry-v1530-IEs OPTIONAL

}

UECapabilityEnquiry-v1530-IEs ::= SEQUENCE {

requestSTTI-SPT-Capability-r15 ENUMERATED {true} OPTIONAL,

eutra-nr-only-r15 ENUMERATED {true} OPTIONAL,

nonCriticalExtension UECapabilityEnquiry-v1550-IEs OPTIONAL

}

UECapabilityEnquiry-v1550-IEs ::= SEQUENCE {

requestedCapabilityNR-r15 OCTET STRING OPTIONAL,

nonCriticalExtension UECapabilityEnquiry-v1560-IEs OPTIONAL

}

UECapabilityEnquiry-v1560-IEs ::= SEQUENCE {

requestedCapabilityCommon-r15 OCTET STRING OPTIONAL,

nonCriticalExtension UECapabilityEnquiry-v1610-IEs OPTIONAL

}

UECapabilityEnquiry-v1610-IEs ::= SEQUENCE {

rrc-SegAllowed-r16 ENUMERATED {enabled} OPTIONAL, -- Need ON

nonCriticalExtension SEQUENCE {} OPTIONAL

}

UE-CapabilityRequest ::= SEQUENCE (SIZE (1..maxRAT-Capabilities)) OF RAT-Type

-- ASN1STOP

| *UECapabilityEnquiry* field descriptions |
| --- |
| ***eutra-nr-only***  Indicates that the UE is requested to provide UE capabilities related to (NG)EN-DC only as specified in TS38.331 [82]. |
| ***requestDiffFallbackCombList***  List of CA band combinations for which the UE is requested to provide different capabilities for their fallback band combinations in conjunction with the capabilities supported for the CA band combinations in this list. The UE shall exclude fallback band combinations for which their supported UE capabilities are the same as the CA band combination indicated in this list. |
| ***requestReducedFormat***  Indicates that the UE is requested to provide supported CA band combinations in the *supportedBandCombinationReduced-r13* instead of the *supportedBandCombination-r10*. The E-UTRAN includes this field if *requestSkipFallbackComb* or *requestDiffFallbackCombList* is included in the message. |
| ***requestSkipFallbackComb***  Indicates that the UE shall explicitly exclude fallback CA band combinations in capability signalling. |
| ***ue-CapabilityRequest***  List of the RATs for which the UE is requested to transfer the UE radio access capabilities i.e. E-UTRA, UTRA, GERAN-CS, GERAN-PS, CDMA2000. A separate *RAT-Type* value applies for some EUTRA-NR capabilities that are transferred by a separate UE capability container, used in case of MRDC. |
| ***requestedFrequencyBands***  List of frequency bands for which the UE is requested to provide supported CA band combinations and non CA bands. |
| ***requestedFreqBandsNR-MRDC***  Interpreted as *FreqBandList* IE as specified in TS 38.331 [82]. It concerns a list of NR and/ or E-UTRA frequency bands for which the UE is requested to provide its supported NR CA and/or MR-DC band combinations (i.e. within the UE capability containers for NR and MR-DC, as requested by E-UTRAN) and feature sets corresponding to the MR-DC band combinations (i.e. within the UE capability containers for LTE and NR, as requested by E-UTRAN). |
| ***requestedCapabilityCommon***  Contains the filter common for all requested MR-DC related capability containers as defined by *UE-CapabilityRequestFilterCommon* IE in TS 38.331 [82]. |
| ***requestedCapabilityNR***  Interpreted as *UE-CapabilityRequestFilterNR* IE as specified in TS 38.331 [82], in which the field *frequencyBandListFilter* is omitted. |
| ***requestedMaxCCsDL, requestedMaxCCsUL***  Indicates the maximum number of CCs for which the UE is requested to provide supported CA band combinations and non-CA bands. |
| ***requestReducedIntNonContComb***  Indicates that the UE shall explicitly exclude supported intra-band non-contiguous CA band combinations other than included in capability signalling as specified in TS 36.306 [5], clause 4.3.5.21. |
| ***requestSTTI-SPT-Capability***  Indicates that the UE is requested to provide its supported short TTI and SPT capabilities in capability signalling. |
| ***rrc-SegAllowed***  A one-shot field that indicates that the UE is enabled to segment the response message into a series of *ULDedicatedMessageSegment* messages. |

#### – *UECapabilityInformation*

The *UECapabilityInformation* message is used to transfer of UE radio access capabilities requested by the E‑UTRAN.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E‑UTRAN

*UECapabilityInformation message*

-- ASN1START

UECapabilityInformation ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

c1 CHOICE{

ueCapabilityInformation-r8 UECapabilityInformation-r8-IEs,

spare7 NULL,

spare6 NULL, spare5 NULL, spare4 NULL,

spare3 NULL, spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

UECapabilityInformation-r8-IEs ::= SEQUENCE {

ue-CapabilityRAT-ContainerList UE-CapabilityRAT-ContainerList,

nonCriticalExtension UECapabilityInformation-v8a0-IEs OPTIONAL

}

UECapabilityInformation-v8a0-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension UECapabilityInformation-v1250-IEs OPTIONAL

}

UECapabilityInformation-v1250-IEs ::= SEQUENCE {

ue-RadioPagingInfo-r12 UE-RadioPagingInfo-r12 OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

| *UECapabilityInformation* field descriptions |
| --- |
| ***ue-RadioPagingInfo***  This field contains UE capability information used for paging. |

#### – *ULDedicatedMessageSegment*

The *ULDedicatedMessageSegment* message is used to transfer segments of the *UECapabilityInformation* message.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E‑UTRAN

*ULDedicatedMessageSegment message*

-- ASN1START

ULDedicatedMessageSegment-r16 ::= SEQUENCE {

criticalExtensions CHOICE {

ulDedicatedMessageSegment-r16 ULDedicatedMessageSegment-r16-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

ULDedicatedMessageSegment-r16-IEs ::= SEQUENCE {

segmentNumber-r16 INTEGER (0..15),

rrc-MessageSegmentContainer-r16 OCTET STRING,

rrc-MessageSegmentType-r16 ENUMERATED {notLastSegment, lastSegment},

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

| *ULDedicatedMessageSegment* field descriptions |
| --- |
| ***segmentNumber***  Identifies the sequence number of a segment within the encoded UL DCCH message. |
| ***rrc-MessageSegmentContainer***  Includes a segment of the encoded UL DCCH message. The size of the included segment in this container should be small enough that the resulting encoded RRC message PDU is less than or equal to the PDCP SDU size limit. |
| ***rrc-MessageSegmentType***  Indicates whether the included UL DCCH message segment is the last segment or not. |

#### – *UEInformationRequest*

The *UEInformationRequest* is the command used by E-UTRAN to retrieve information from the UE.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: E‑UTRAN to UE

*UEInformationRequest message*

-- ASN1START

UEInformationRequest-r9 ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

c1 CHOICE {

ueInformationRequest-r9 UEInformationRequest-r9-IEs,

spare3 NULL, spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

UEInformationRequest-r9-IEs ::= SEQUENCE {

rach-ReportReq-r9 BOOLEAN,

rlf-ReportReq-r9 BOOLEAN,

nonCriticalExtension UEInformationRequest-v930-IEs OPTIONAL

}

UEInformationRequest-v930-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension UEInformationRequest-v1020-IEs OPTIONAL

}

UEInformationRequest-v1020-IEs ::= SEQUENCE {

logMeasReportReq-r10 ENUMERATED {true} OPTIONAL, -- Need ON

nonCriticalExtension UEInformationRequest-v1130-IEs OPTIONAL

}

UEInformationRequest-v1130-IEs ::= SEQUENCE {

connEstFailReportReq-r11 ENUMERATED {true} OPTIONAL, -- Need ON

nonCriticalExtension UEInformationRequest-v1250-IEs OPTIONAL

}

UEInformationRequest-v1250-IEs ::= SEQUENCE {

mobilityHistoryReportReq-r12 ENUMERATED {true} OPTIONAL, -- Need ON

nonCriticalExtension UEInformationRequest-v1530-IEs OPTIONAL

}

UEInformationRequest-v1530-IEs ::= SEQUENCE {

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

flightPathInfoReq-r15 FlightPathInfoReportConfig-r15 OPTIONAL, -- Need ON

nonCriticalExtension UEInformationRequest-v1710-IEs OPTIONAL

}

UEInformationRequest-v1710-IEs ::= SEQUENCE {

coarseLocationReq-r17 ENUMERATED {true} OPTIONAL, -- Need ON

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

| *UEInformationRequest* field descriptions |
| --- |
| ***coarseLocationReq***  This field is used to request UE to report coarse location information. |
| ***rach-ReportReq***  This field is used to indicate whether the UE shall report information about the random access procedure. |

#### – *UEInformationResponse*

The *UEInformationResponse* message is used by the UE to transfer the information requested by the E-UTRAN.

Signalling radio bearer: SRB1 or SRB2 (when logged measurement information is included)

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E-UTRAN

*UEInformationResponse message*

-- ASN1START

UEInformationResponse-r9 ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

c1 CHOICE {

ueInformationResponse-r9 UEInformationResponse-r9-IEs,

spare3 NULL, spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

UEInformationResponse-r9-IEs ::= SEQUENCE {

rach-Report-r9 RACH-Report-r16 OPTIONAL,

rlf-Report-r9 RLF-Report-r9 OPTIONAL,

nonCriticalExtension UEInformationResponse-v930-IEs OPTIONAL

}

-- Late non critical extensions

UEInformationResponse-v9e0-IEs ::= SEQUENCE {

rlf-Report-v9e0 RLF-Report-v9e0 OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- Regular non critical extensions

UEInformationResponse-v930-IEs ::= SEQUENCE {

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

nonCriticalExtension UEInformationResponse-v1020-IEs OPTIONAL

}

UEInformationResponse-v1020-IEs ::= SEQUENCE {

logMeasReport-r10 LogMeasReport-r10 OPTIONAL,

nonCriticalExtension UEInformationResponse-v1130-IEs OPTIONAL

}

UEInformationResponse-v1130-IEs ::= SEQUENCE {

connEstFailReport-r11 ConnEstFailReport-r11 OPTIONAL,

nonCriticalExtension UEInformationResponse-v1250-IEs OPTIONAL

}

UEInformationResponse-v1250-IEs ::= SEQUENCE {

mobilityHistoryReport-r12 MobilityHistoryReport-r12 OPTIONAL,

nonCriticalExtension UEInformationResponse-v1530-IEs OPTIONAL

}

UEInformationResponse-v1530-IEs ::= SEQUENCE {

measResultListIdle-r15 MeasResultListIdle-r15 OPTIONAL,

flightPathInfoReport-r15 FlightPathInfoReport-r15 OPTIONAL,

nonCriticalExtension UEInformationResponse-v1610-IEs OPTIONAL

}

UEInformationResponse-v1610-IEs ::= SEQUENCE {

rach-Report-v1610 RACH-Report-v1610 OPTIONAL,

measResultListExtIdle-r16 MeasResultListExtIdle-r16 OPTIONAL,

measResultListIdleNR-r16 MeasResultListIdleNR-r16 OPTIONAL,

nonCriticalExtension UEInformationResponse-v1710-IEs OPTIONAL

}

UEInformationResponse-v1710-IEs ::= SEQUENCE {

coarseLocationInfo-r17 OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

RACH-Report-r16 ::= SEQUENCE {

numberOfPreamblesSent-r16 NumberOfPreamblesSent-r11,

contentionDetected-r16 BOOLEAN

}

RACH-Report-v1610 ::= SEQUENCE {

initialCEL-r16 INTEGER (0..3),

edt-Fallback-r16 BOOLEAN

}

RLF-Report-r9 ::= SEQUENCE {

measResultLastServCell-r9 SEQUENCE {

rsrpResult-r9 RSRP-Range,

rsrqResult-r9 RSRQ-Range OPTIONAL

},

measResultNeighCells-r9 SEQUENCE {

measResultListEUTRA-r9 MeasResultList2EUTRA-r9 OPTIONAL,

measResultListUTRA-r9 MeasResultList2UTRA-r9 OPTIONAL,

measResultListGERAN-r9 MeasResultListGERAN OPTIONAL,

measResultsCDMA2000-r9 MeasResultList2CDMA2000-r9 OPTIONAL

} OPTIONAL,

...,

[[ locationInfo-r10 LocationInfo-r10 OPTIONAL,

failedPCellId-r10 CHOICE {

cellGlobalId-r10 CellGlobalIdEUTRA,

pci-arfcn-r10 SEQUENCE {

physCellId-r10 PhysCellId,

carrierFreq-r10 ARFCN-ValueEUTRA

}

} OPTIONAL,

reestablishmentCellId-r10 CellGlobalIdEUTRA OPTIONAL,

timeConnFailure-r10 INTEGER (0..1023) OPTIONAL,

connectionFailureType-r10 ENUMERATED {rlf, hof} OPTIONAL,

previousPCellId-r10 CellGlobalIdEUTRA OPTIONAL

]],

[[ failedPCellId-v1090 SEQUENCE {

carrierFreq-v1090 ARFCN-ValueEUTRA-v9e0

} OPTIONAL

]],

[[ basicFields-r11 SEQUENCE {

c-RNTI-r11 C-RNTI,

rlf-Cause-r11 ENUMERATED {

t310-Expiry, randomAccessProblem,

rlc-MaxNumRetx, t312-Expiry-r12},

timeSinceFailure-r11 TimeSinceFailure-r11

} OPTIONAL,

previousUTRA-CellId-r11 SEQUENCE {

carrierFreq-r11 ARFCN-ValueUTRA,

physCellId-r11 CHOICE {

fdd-r11 PhysCellIdUTRA-FDD,

tdd-r11 PhysCellIdUTRA-TDD

},

cellGlobalId-r11 CellGlobalIdUTRA OPTIONAL

} OPTIONAL,

selectedUTRA-CellId-r11 SEQUENCE {

carrierFreq-r11 ARFCN-ValueUTRA,

physCellId-r11 CHOICE {

fdd-r11 PhysCellIdUTRA-FDD,

tdd-r11 PhysCellIdUTRA-TDD

}

} OPTIONAL

]],

[[ failedPCellId-v1250 SEQUENCE {

tac-FailedPCell-r12 TrackingAreaCode

} OPTIONAL,

measResultLastServCell-v1250 RSRQ-Range-v1250 OPTIONAL,

lastServCellRSRQ-Type-r12 RSRQ-Type-r12 OPTIONAL,

measResultListEUTRA-v1250 MeasResultList2EUTRA-v1250 OPTIONAL

]],

[[ drb-EstablishedWithQCI-1-r13 ENUMERATED {qci1} OPTIONAL

]],

[[ measResultLastServCell-v1360 RSRP-Range-v1360 OPTIONAL

]],

[[ logMeasResultListBT-r15 LogMeasResultListBT-r15 OPTIONAL,

logMeasResultListWLAN-r15 LogMeasResultListWLAN-r15 OPTIONAL

]],

[[ measResultListNR-r16 MeasResultCellListNR-r15 OPTIONAL,

previousNR-PCellId-r16 CellGlobalIdNR-r16 OPTIONAL,

failedNR-PCellId-r16 CHOICE {

cellGlobalId-r16 CellGlobalIdNR-r16,

pci-arfcn-r16 SEQUENCE {

physCellId-r16 PhysCellIdNR-r15,

carrierFreq-r16 ARFCN-ValueNR-r15

}

} OPTIONAL,

reconnectCellId-r16 CHOICE {

nrReconnectCellId-r16 CellGlobalIdNR-r16,

eutraReconnectCellId-r16 SEQUENCE {

cellGlobalId-r16 CellGlobalIdEUTRA,

trackingAreaCode-EPC-r16 TrackingAreaCode OPTIONAL,

trackingAreaCode-5GC-r16 TrackingAreaCode-5GC-r15 OPTIONAL

}

} OPTIONAL,

timeUntilReconnection-r16 TimeUntilReconnection-r16 OPTIONAL

]],

[[ measResultListNR-v1640 SEQUENCE {

carrierFreqNR-r16 ARFCN-ValueNR-r15

} OPTIONAL,

measResultListExtNR-r16 MeasResultFreqListNR-r16 OPTIONAL

]]

}

RLF-Report-v9e0 ::= SEQUENCE {

measResultListEUTRA-v9e0 MeasResultList2EUTRA-v9e0

}

MeasResultList2EUTRA-r9 ::= SEQUENCE (SIZE (1..maxFreq)) OF MeasResult2EUTRA-r9

MeasResultList2EUTRA-v9e0 ::= SEQUENCE (SIZE (1..maxFreq)) OF MeasResult2EUTRA-v9e0

MeasResultList2EUTRA-v1250 ::= SEQUENCE (SIZE (1..maxFreq)) OF MeasResult2EUTRA-v1250

MeasResult2EUTRA-r9 ::= SEQUENCE {

carrierFreq-r9 ARFCN-ValueEUTRA,

measResultList-r9 MeasResultListEUTRA

}

MeasResult2EUTRA-v9e0 ::= SEQUENCE {

carrierFreq-v9e0 ARFCN-ValueEUTRA-v9e0 OPTIONAL

}

MeasResult2EUTRA-v1250 ::= SEQUENCE {

rsrq-Type-r12 RSRQ-Type-r12 OPTIONAL

}

MeasResultList2UTRA-r9 ::= SEQUENCE (SIZE (1..maxFreq)) OF MeasResult2UTRA-r9

MeasResult2UTRA-r9 ::= SEQUENCE {

carrierFreq-r9 ARFCN-ValueUTRA,

measResultList-r9 MeasResultListUTRA

}

MeasResultList2CDMA2000-r9 ::= SEQUENCE (SIZE (1..maxFreq)) OF MeasResult2CDMA2000-r9

MeasResult2CDMA2000-r9 ::= SEQUENCE {

carrierFreq-r9 CarrierFreqCDMA2000,

measResultList-r9 MeasResultsCDMA2000

}

LogMeasReport-r10 ::= SEQUENCE {

absoluteTimeStamp-r10 AbsoluteTimeInfo-r10,

traceReference-r10 TraceReference-r10,

traceRecordingSessionRef-r10 OCTET STRING (SIZE (2)),

tce-Id-r10 OCTET STRING (SIZE (1)),

logMeasInfoList-r10 LogMeasInfoList-r10,

logMeasAvailable-r10 ENUMERATED {true} OPTIONAL,

...,

[[ logMeasAvailableBT-r15 ENUMERATED {true} OPTIONAL,

logMeasAvailableWLAN-r15 ENUMERATED {true} OPTIONAL

]]

}

LogMeasInfoList-r10 ::= SEQUENCE (SIZE (1..maxLogMeasReport-r10)) OF LogMeasInfo-r10

LogMeasInfo-r10 ::= SEQUENCE {

locationInfo-r10 LocationInfo-r10 OPTIONAL,

relativeTimeStamp-r10 INTEGER (0..7200),

servCellIdentity-r10 CellGlobalIdEUTRA,

measResultServCell-r10 SEQUENCE {

rsrpResult-r10 RSRP-Range,

rsrqResult-r10 RSRQ-Range

},

measResultNeighCells-r10 SEQUENCE {

measResultListEUTRA-r10 MeasResultList2EUTRA-r9 OPTIONAL,

measResultListUTRA-r10 MeasResultList2UTRA-r9 OPTIONAL,

measResultListGERAN-r10 MeasResultList2GERAN-r10 OPTIONAL,

measResultListCDMA2000-r10 MeasResultList2CDMA2000-r9 OPTIONAL

} OPTIONAL,

...,

[[ measResultListEUTRA-v1090 MeasResultList2EUTRA-v9e0 OPTIONAL

]],

[[ measResultListMBSFN-r12 MeasResultListMBSFN-r12 OPTIONAL,

measResultServCell-v1250 RSRQ-Range-v1250 OPTIONAL,

servCellRSRQ-Type-r12 RSRQ-Type-r12 OPTIONAL,

measResultListEUTRA-v1250 MeasResultList2EUTRA-v1250 OPTIONAL

]],

[[ inDeviceCoexDetected-r13 ENUMERATED {true} OPTIONAL

]],

[[ measResultServCell-v1360 RSRP-Range-v1360 OPTIONAL

]],

[[ logMeasResultListBT-r15 LogMeasResultListBT-r15 OPTIONAL,

logMeasResultListWLAN-r15 LogMeasResultListWLAN-r15 OPTIONAL

]],

[[ anyCellSelectionDetected-r15 ENUMERATED {true} OPTIONAL

]],

[[ measResultListNR-r16 MeasResultCellListNR-r15 OPTIONAL

]],

[[ measResultListNR-v1640 SEQUENCE {

carrierFreqNR-r16 ARFCN-ValueNR-r15

} OPTIONAL,

measResultListExtNR-r16 MeasResultFreqListNR-r16 OPTIONAL

]],

[[ uncomBarPreMeasResult-r17 OCTET STRING OPTIONAL

]]

}

MeasResultListMBSFN-r12 ::= SEQUENCE (SIZE (1..maxMBSFN-Area)) OF MeasResultMBSFN-r12

MeasResultMBSFN-r12 ::= SEQUENCE {

mbsfn-Area-r12 SEQUENCE {

mbsfn-AreaId-r12 MBSFN-AreaId-r12,

carrierFreq-r12 ARFCN-ValueEUTRA-r9

},

rsrpResultMBSFN-r12 RSRP-Range,

rsrqResultMBSFN-r12 MBSFN-RSRQ-Range-r12,

signallingBLER-Result-r12 BLER-Result-r12 OPTIONAL,

dataBLER-MCH-ResultList-r12 DataBLER-MCH-ResultList-r12 OPTIONAL,

...

}

DataBLER-MCH-ResultList-r12 ::= SEQUENCE (SIZE (1.. maxPMCH-PerMBSFN)) OF DataBLER-MCH-Result-r12

DataBLER-MCH-Result-r12 ::= SEQUENCE {

mch-Index-r12 INTEGER (1..maxPMCH-PerMBSFN),

dataBLER-Result-r12 BLER-Result-r12

}

BLER-Result-r12 ::= SEQUENCE {

bler-r12 BLER-Range-r12,

blocksReceived-r12 SEQUENCE {

n-r12 BIT STRING (SIZE (3)),

m-r12 BIT STRING (SIZE (8))

}

}

BLER-Range-r12 ::= INTEGER(0..31)

MeasResultList2GERAN-r10 ::= SEQUENCE (SIZE (1..maxCellListGERAN)) OF MeasResultListGERAN

MeasResultFreqListNR-r16::= SEQUENCE (SIZE (1..maxFreq-1-r16)) OF MeasResultFreqFailNR-r15

ConnEstFailReport-r11 ::= SEQUENCE {

failedCellId-r11 CellGlobalIdEUTRA,

locationInfo-r11 LocationInfo-r10 OPTIONAL,

measResultFailedCell-r11 SEQUENCE {

rsrpResult-r11 RSRP-Range,

rsrqResult-r11 RSRQ-Range OPTIONAL

},

measResultNeighCells-r11 SEQUENCE {

measResultListEUTRA-r11 MeasResultList2EUTRA-r9 OPTIONAL,

measResultListUTRA-r11 MeasResultList2UTRA-r9 OPTIONAL,

measResultListGERAN-r11 MeasResultListGERAN OPTIONAL,

measResultsCDMA2000-r11 MeasResultList2CDMA2000-r9 OPTIONAL

} OPTIONAL,

numberOfPreamblesSent-r11 NumberOfPreamblesSent-r11,

contentionDetected-r11 BOOLEAN,

maxTxPowerReached-r11 BOOLEAN,

timeSinceFailure-r11 TimeSinceFailure-r11,

measResultListEUTRA-v1130 MeasResultList2EUTRA-v9e0 OPTIONAL,

...,

[[ measResultFailedCell-v1250 RSRQ-Range-v1250 OPTIONAL,

failedCellRSRQ-Type-r12 RSRQ-Type-r12 OPTIONAL,

measResultListEUTRA-v1250 MeasResultList2EUTRA-v1250 OPTIONAL

]],

[[ measResultFailedCell-v1360 RSRP-Range-v1360 OPTIONAL

]],

[[ logMeasResultListBT-r15 LogMeasResultListBT-r15 OPTIONAL,

logMeasResultListWLAN-r15 LogMeasResultListWLAN-r15 OPTIONAL

]],

[[ measResultListNR-r16 MeasResultCellListNR-r15 OPTIONAL

]],

[[ measResultListNR-v1640 SEQUENCE {

carrierFreqNR-r16 ARFCN-ValueNR-r15

} OPTIONAL,

measResultListExtNR-r16 MeasResultFreqListNR-r16 OPTIONAL

]]

}

NumberOfPreamblesSent-r11::= INTEGER (1..200)

TimeSinceFailure-r11 ::= INTEGER (0..172800)

TimeUntilReconnection-r16 ::= INTEGER (0..172800)

MobilityHistoryReport-r12 ::= VisitedCellInfoList-r12

FlightPathInfoReport-r15 ::= SEQUENCE {

flightPath-r15 SEQUENCE (SIZE (1..maxWayPoint-r15)) OF WayPointLocation-r15 OPTIONAL,

dummy SEQUENCE {} OPTIONAL

}

WayPointLocation-r15 ::= SEQUENCE {

wayPointLocation-r15 LocationInfo-r10,

timeStamp-r15 AbsoluteTimeInfo-r10 OPTIONAL

}

-- ASN1STOP

| *UEInformationResponse* field descriptions |
| --- |
| ***absoluteTimeStamp***  Indicates the absolute time when the logged measurement configuration logging is provided, as indicated by E-UTRAN within *absoluteTimeInfo*. |
| ***anyCellSelectionDetected***  This field is used to indicate the detection of *any cell selection* state, as defined in TS 36.304 [4]. The UE sets this field when performing the logging of measurement results in RRC\_IDLE and there is no suitable cell or no acceptable cell. |
| ***bler***  Indicates the measured BLER value. The coding of BLER value is defined in TS 36.133 [16]. |
| ***blocksReceived***  Indicates total number of MCH blocks, which were received by the UE and used for the corresponding BLER calculation, within the measurement period as defined in TS 36.133 [16]. |
| ***carrierFreq***  In case the UE includes *carrierFreq-v9e0* and/ or *carrierFreq-v1090*, the UE shall set the corresponding entry of *carrierFreq-r9* and/ or *carrierFreq-r10* respectively to *maxEARFCN*. For E-UTRA and UTRA frequencies, the UE sets the ARFCN according to the band used when obtaining the concerned measurement results. |
| ***carrierFreqNR***  In case the UE includes *measResultListNR*, the UE uses this field to indicate the ARFCN value according to the band used when obtaining the concrned measurement results |
| ***connectionFailureType***  This field is used to indicate whether the connection failure is due to radio link failure or handover failure. |
| ***contentionDetected***  This field is used to indicate that contention was detected for at least one of the transmitted preambles, see TS 36.321 [6]. |
| ***coarseLocationInfo***  Parameter type Ellipsoid-Point defined in TS 37.355 [109]. The first/leftmost bit of the first octet contains the most significant bit. The least significant bits of *degreesLatitude* and *degreesLongitude* are set to 0 to meet the accuracy requirement which corresponds to a granularity of approximately 2 km.  It is up to UE implementation how many LSBs are set to 0 to meet the accuracy requirement. |
| ***c-RNTI***  This field indicates the C-RNTI used in the PCell upon detecting radio link failure or the C-RNTI used in the source PCell upon handover failure. |
| ***dataBLER-MCH-ResultList***  Includes a BLER result per MCH on subframes using *dataMCS*, with the applicable MCH(s) listed in the same order as in *pmch-InfoList* within *MBSFNAreaConfiguration*. |
| ***drb-EstablishedWithQCI-1***  This field is used to indicate the radio link failure occurred while a bearer with QCI value equal to 1 was configured, see TS 24.301 [35]. |
| ***dummy***  This field is not used in the specification. It shall not be sent by the UE. |
| ***edt-Fallback***  Value TRUE indicates the last successfully completed random access procedure was initiated with EDT PRACH resource and succeeded after receiving EDT fallback indication from lower layers. |
| ***failedCellId***  This field is used to indicate the cell in which connection establishment failed. |
| ***failedPCellId***  This field is used to indicate the PCell in which RLF is detected or the target PCell of the failed handover. The UE sets the EARFCN according to the band used for transmission/ reception when the failure occurred. |
| ***inDeviceCoexDetected***  Indicates that measurement logging is suspended due to IDC problem detection. |
| ***initialCEL***  Indicates the initial CE level used for the last successfully completed random access procedure for BL UEs and UEs in CE. |
| ***logMeasResultListBT***  This field refers to the Bluetooth measurement results. |
| ***logMeasResultListWLAN***  This field refers to the WLAN measurement results. |
| ***maxTxPowerReached***  This field is used to indicate whether or not the maximum power level was used for the last transmitted preamble, see TS 36.321 [6]. |
| ***mch-Index***  Indicates the MCH by referring to the entry as listed in *pmch-InfoList* within *MBSFNAreaConfiguration*. |
| ***measResultFailedCell***  This field refers to the last measurement results taken in the cell, where connection establishment failure happened. For UE supporting CE Mode B, when CE mode B is not restricted by upper layers, *measResultFailedCell-v1360* is reported if the measured RSRP is less than -140 dBm. |
| ***measResultLastServCell***  This field refers to the last measurement results taken in the PCell, where radio link failure or handover failure happened. For BL UEs or UEs in CE, when operating in CE Mode B, *measResultLastServCell-v1360* is reported if the measured RSRP is less than -140 dBm. |
| ***measResultListEUTRA***  If *measResultListEUTRA-v9e0*, *measResultListEUTRA-v1090* or *measResultListEUTRA-v1130* is included, the UE shall include the same number of entries, and listed in the same order, as in *measResultListEUTRA-r9*, *measResultListEUTRA-r10* and/ or *measResultListEUTRA-r11* respectively. |
| ***measResultListEUTRA-v1250***  If included in *RLF-Report-r9* the UE shall include the same number of entries, and listed in the same order, as in *measResultListEUTRA-r9*;  If included in *LogMeasInfo-r10* the UE shall include the same number of entries, and listed in the same order, as in *measResultListEUTRA-r10*;  If included in *ConnEstFailReport-r11* the UE shall include the same number of entries, and listed in the same order, as in *measResultListEUTRA-r11*; |
| ***measResultListIdle***  This field indicates the E-UTRA measurement results done during RRC\_IDLE and RRC\_INACTIVE at network request. |
| ***measResultListIdleNR***  This field indicates the NR measurement results done during RRC\_IDLE and RRC\_INACTIVE at network request. |
| ***measResultListNR, measResultListExtNR***  Includes NR measurement results, with *measResultListNR* including results of a first NR frequency and *measResultListExtNR* including results of additinal NR frequencies, if available. |
| ***measResultServCell***  This field refers to the log measurement results taken in the Serving cell. For UE supporting CE Mode B, when CE mode B is not restricted by upper layers, *measResultServCell-v1360* is reported if the measured RSRP is less than -140 dBm. |
| ***mobilityHistoryReport***  This field is used to indicate the time of stay in 16 most recently visited E-UTRA cells or of stay out of E-UTRA. |
| ***numberOfPreamblesSent***  This field is used to indicate the number of RACH preambles that were transmitted. Corresponds to parameter PREAMBLE\_TRANSMISSION\_COUNTER in TS 36.321 [6]. |
| ***previousPCellId***  This field is used to indicate the source PCell of the last handover (source PCell when the last *RRCConnectionReconfiguration* message including *mobilityControlInfo* was received). |
| ***previousUTRA-CellId***  This field is used to indicate the source UTRA cell of the last successful handover to E-UTRAN, when RLF occurred at the target PCell. The UE sets the ARFCN according to the band used for transmission/ reception on the concerned cell. |
| ***reconnectCellId***  This field is used to indicate the cell in which the UE comes back to connected after connection failure and after failing to perform reestablishment. If the UE comes back to RRC CONNECTED in an NR cell then *nrReconnectCellID* is included and if the UE comes back to RRC CONNECTED in an LTE cell then *eutraReconnectCellID* is included. |
| ***reestablishmentCellId***  This field is used to indicate the cell in which the re-establishment attempt was made after connection failure. |
| ***relativeTimeStamp***  Indicates the time of logging measurement results, measured relative to the *absoluteTimeStamp*. Value in seconds. |
| ***rlf-Cause***  This field is used to indicate the cause of the last radio link failure that was detected. In case of handover failure information reporting (i.e., the *connectionFailureType* is set to '*hof*'), the UE is allowed to set this field to any value. |
| ***selectedUTRA-CellId***  This field is used to indicate the UTRA cell that the UE selects after RLF is detected, while T311 is running. The UE sets the ARFCN according to the band selected for transmission/ reception on the concerned cell. |
| ***signallingBLER-Result***  Includes a BLER result of MBSFN subframes using *signallingMCS*. |
| ***tac-FailedPCell***  This field is used to indicate the Tracking Area Code of the PCell in which RLF is detected. |
| ***tce-Id***  Parameter Trace Collection Entity Id: See TS 32.422 [58]. |
| ***timeConnFailure***  This field is used to indicate the time elapsed since the last HO initialization until connection failure. Actual value = field value \* 100ms. The maximum value 1023 means 102.3s or longer. |
| ***timeSinceFailure***  This field is used to indicate the time that elapsed since the connection (establishment) failure. Value in seconds. The maximum value 172800 means 172800s or longer. |
| ***timeStamp***  Includes time stamps for the waypoints that describe planned locations for the UE. |
| ***timeUntilReconnection***  This field is used to indicate the time that elapsed between the connection (radio link or handover) failure and the next time the UE comes to RRC CONNECTED in an NR or EUTRA cell, after failing to perform reestablishment. Value in seconds. The maximum value 172800 means 172800s or longer. |
| ***traceRecordingSessionRef***  Parameter Trace Recording Session Reference: See TS 32.422 [58]. |
| ***uncomBarPreMeasResult***  This field provides barometric pressure measurements as *Sensor-MeasurementInformation* defined in TS 37.355 [109]. The first/leftmost bit of the first octet contains the most significant bit. |
| ***wayPointLocation***  Includes location coordinates for a UE for Aerial UE operation. The waypoints describe planned locations for the UE. |

#### – *ULHandoverPreparationTransfer (CDMA2000)*

The *ULHandoverPreparationTransfer* message is used for the uplink transfer of handover related CDMA2000 information when requested by the higher layers.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E‑UTRAN

*ULHandoverPreparationTransfer message*

-- ASN1START

ULHandoverPreparationTransfer ::= SEQUENCE {

criticalExtensions CHOICE {

c1 CHOICE {

ulHandoverPreparationTransfer-r8 ULHandoverPreparationTransfer-r8-IEs,

spare3 NULL, spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

ULHandoverPreparationTransfer-r8-IEs ::= SEQUENCE {

cdma2000-Type CDMA2000-Type,

meid BIT STRING (SIZE (56)) OPTIONAL,

dedicatedInfo DedicatedInfoCDMA2000,

nonCriticalExtension ULHandoverPreparationTransfer-v8a0-IEs OPTIONAL

}

ULHandoverPreparationTransfer-v8a0-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

| *ULHandoverPreparationTransfer* field descriptions |
| --- |
| ***meid***  The 56 bit mobile identification number provided by the CDMA2000 Upper layers. |

#### – *ULInformationTransfer*

The *ULInformationTransfer* message is used for the uplink transfer of NAS, non-3GPP dedicated information, or IAB-DU specific F1-C related information.

Signalling radio bearer: SRB2 or SRB1 (only if SRB2 not established yet). If SRB2 is suspended, the UE does not send this message until SRB2 is resumed. If only *dedicatedInfoF1c* is included, SRB2 is used.

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E‑UTRAN

*ULInformationTransfer message*

-- ASN1START

ULInformationTransfer ::= SEQUENCE {

criticalExtensions CHOICE {

c1 CHOICE {

ulInformationTransfer-r8 ULInformationTransfer-r8-IEs,

ulInformationTransfer-r16 ULInformationTransfer-r16-IEs,

spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

ULInformationTransfer-r8-IEs ::= SEQUENCE {

dedicatedInfoType CHOICE {

dedicatedInfoNAS DedicatedInfoNAS,

dedicatedInfoCDMA2000-1XRTT DedicatedInfoCDMA2000,

dedicatedInfoCDMA2000-HRPD DedicatedInfoCDMA2000

},

nonCriticalExtension ULInformationTransfer-v8a0-IEs OPTIONAL

}

ULInformationTransfer-v8a0-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

ULInformationTransfer-r16-IEs ::= SEQUENCE {

dedicatedInfoType-r16 CHOICE {

dedicatedInfoNAS-r16 DedicatedInfoNAS,

dedicatedInfoCDMA2000-1XRTT-r16 DedicatedInfoCDMA2000,

dedicatedInfoCDMA2000-HRPD-r16 DedicatedInfoCDMA2000

} OPTIONAL,

dedicatedInfoF1c-r16 DedicatedInfoF1c-r16 OPTIONAL,

nonCriticalExtension ULInformationTransfer-v8a0-IEs OPTIONAL

}

-- ASN1STOP

#### – *ULInformationTransferIRAT*

The *ULInformationTransferIRAT* message is used for the uplink transfer of information terminated by E-UTRAN but specified by anoher RAT. In this release of the specification, the message is used for sidelink information specified by TS 38.331.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E‑UTRAN

*ULInformationTransferIRAT* message

-- ASN1START

ULInformationTransferIRAT-r16 ::= SEQUENCE {

criticalExtensions CHOICE {

c1 CHOICE {

ulInformationTransferIRAT-r16 ULInformationTransferIRAT-r16-IEs,

spare3 NULL, spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

ULInformationTransferIRAT-r16-IEs ::= SEQUENCE {

ul-DCCH-MessageNR-r16 OCTET STRING OPTIONAL,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

| *ULInformationTransferIRAT* field descriptions |
| --- |
| ***ul-DCCH-MessageNR***  Includes the *UL-DCCH-Message* as defined in TS 38.331 [82]. In this version of the specification, the field is only used to transfer the NR RRC *MeasurementReport*, NR RRC *SidelinkUEInformationNR* and the NR RRC *UEAssistanceInformation* messages. |

#### – *ULInformationTransferMRDC*

The *ULInformationTransferMRDC* message is used for the uplink transfer of MR DC information (i.e. for the case the SCG employs another RAT e.g. for transferring the NR RRC Measurement Report message).

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E‑UTRAN

*ULInformationTransferMRDC message*

-- ASN1START

ULInformationTransferMRDC-r15 ::= SEQUENCE {

criticalExtensions CHOICE {

c1 CHOICE {

ulInformationTransferMRDC-r15 ULInformationTransferMRDC-r15-IEs,

spare3 NULL, spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

ULInformationTransferMRDC-r15-IEs ::= SEQUENCE {

ul-DCCH-MessageNR-r15 OCTET STRING OPTIONAL,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

| *ULInformationTransferMRDC* field descriptions |
| --- |
| ***ul-DCCH-MessageNR***  Includes the *UL-DCCH-Message* as defined in TS 38.331 [82]. In this version of the specification, the field is only used to transfer the NR RRC *MeasurementReport*, NR RRC *UEAssistanceInformation*, NR RRC *IABOtherInformation*, NR RRC *FailureInformation,* and the NR RRC *RRCReconfigurationComplete* messages. |

#### – *WLANConnectionStatusReport*

The *WLANConnectionStatusReport* message is used to inform the successful connection to WLAN or failure of the WLAN connection or connection attempt(s).

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E-UTRAN

*WLANConnectionStatusReport message*

-- ASN1START

WLANConnectionStatusReport-r13 ::= SEQUENCE {

criticalExtensions CHOICE {

c1 CHOICE {

wlanConnectionStatusReport-r13 WLANConnectionStatusReport-r13-IEs,

spare3 NULL, spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

WLANConnectionStatusReport-r13-IEs ::= SEQUENCE {

wlan-Status-r13 WLAN-Status-r13,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension WLANConnectionStatusReport-v1430-IEs OPTIONAL

}

WLANConnectionStatusReport-v1430-IEs ::= SEQUENCE {

wlan-Status-v1430 WLAN-Status-v1430,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

| *WLANConnectionStatusReport* field descriptions |
| --- |
| ***wlan-Status***  Indicates the connection status to WLAN and the cause of failures. If the *wlan-Status-v1430* is included, E-UTRAN ignores the *wlan-Status-r13*. |

## 6.3 RRC information elements

### 6.3.0 Parameterized types

#### – *SetupRelease*

*SetupRelease* allows the *ElementTypeParam* to be used as the referenced data type for the setup and release entries. See A.3.8 for guidelines.

-- ASN1START

SetupRelease { ElementTypeParam } ::= CHOICE {

release NULL,

setup ElementTypeParam

}

-- ASN1STOP

### 6.3.1 System information blocks

#### – *SystemInformationBlockPos*

The IE *SystemInformationBlockPos* contains positioning assistance data as defined in TS 36.355 [54].

*SystemInformationBlockPos* information element

-- ASN1START

SystemInformationBlockPos-r15 ::= SEQUENCE {

assistanceDataSIB-Element-r15 OCTET STRING,

lateNonCriticalExtension OCTET STRING OPTIONAL,

...

}

-- ASN1STOP

| *SystemInformationBlockPos* field descriptions |
| --- |
| ***assistanceDataSIB-Element***  Parameter *AssistanceDataSIBelement* defined in TS 36.355 [54]. The first/leftmost bit of the first octet contains the most significant bit. |

#### – *SystemInformationBlockType2*

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

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

*SystemInformationBlockType2* information element

-- ASN1START

SystemInformationBlockType2 ::= SEQUENCE {

ac-BarringInfo SEQUENCE {

ac-BarringForEmergency BOOLEAN,

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

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

} OPTIONAL, -- Need OP

radioResourceConfigCommon RadioResourceConfigCommonSIB,

ue-TimersAndConstants UE-TimersAndConstants,

freqInfo SEQUENCE {

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

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

OPTIONAL, -- Need OP

additionalSpectrumEmission AdditionalSpectrumEmission

},

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

timeAlignmentTimerCommon TimeAlignmentTimer,

...,

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

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

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

]],

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

]],

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

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

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

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

]],

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

]],

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

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

]],

[[

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

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

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

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

]],

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

]],

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

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

]],

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

]],

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

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

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

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

]],

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

]],

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

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

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

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

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

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

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

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

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

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

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

]]

}

SystemInformationBlockType2-v8h0-IEs ::= SEQUENCE {

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

nonCriticalExtension SystemInformationBlockType2-v9e0-IEs OPTIONAL

}

SystemInformationBlockType2-v9e0-IEs ::= SEQUENCE {

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

nonCriticalExtension SystemInformationBlockType2-v9i0-IEs OPTIONAL

}

SystemInformationBlockType2-v9i0-IEs ::= SEQUENCE {

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

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

dummy SEQUENCE {} OPTIONAL

}

SystemInformationBlockType2-v10m0-IEs ::= SEQUENCE {

freqInfo-v10l0 SEQUENCE {

additionalSpectrumEmission-v10l0 AdditionalSpectrumEmission-v10l0

} OPTIONAL,

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

AdditionalSpectrumEmission-v10l0 OPTIONAL,

nonCriticalExtension SystemInformationBlockType2-v10n0-IEs OPTIONAL

}

SystemInformationBlockType2-v10n0-IEs ::= SEQUENCE {

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

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SystemInformationBlockType2-v13c0-IEs OPTIONAL

}

SystemInformationBlockType2-v13c0-IEs ::= SEQUENCE {

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

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

nonCriticalExtension SEQUENCE {} OPTIONAL

}

AC-BarringConfig ::= SEQUENCE {

ac-BarringFactor ENUMERATED {

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

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

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

ac-BarringForSpecialAC BIT STRING (SIZE(5))

}

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

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

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

AC-BarringPerPLMN-r12 ::= SEQUENCE {

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

ac-BarringInfo-r12 SEQUENCE {

ac-BarringForEmergency-r12 BOOLEAN,

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

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

} OPTIONAL, -- Need OP

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

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

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

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

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

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

}

ACDC-BarringForCommon-r13 ::= SEQUENCE {

acdc-HPLMNonly-r13 BOOLEAN,

barringPerACDC-CategoryList-r13 BarringPerACDC-CategoryList-r13

}

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

ACDC-BarringPerPLMN-r13 ::= SEQUENCE {

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

acdc-OnlyForHPLMN-r13 BOOLEAN,

barringPerACDC-CategoryList-r13 BarringPerACDC-CategoryList-r13

}

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

BarringPerACDC-Category-r13 ::= SEQUENCE {

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

acdc-BarringConfig-r13 SEQUENCE {

ac-BarringFactor-r13 ENUMERATED {

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

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

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

} OPTIONAL -- Need OP

}

UDT-Restricting-r13 ::= SEQUENCE {

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

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

}

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

UDT-RestrictingPerPLMN-r13 ::= SEQUENCE {

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

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

}

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

CIOT-OptimisationPLMN-r13::= SEQUENCE {

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

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

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

}

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

PLMN-Info-r15 ::= SEQUENCE {

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

}

-- ASN1STOP

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

#### – *SystemInformationBlockType3*

The IE *SystemInformationBlockType3* contains cell re-selection information common for intra-frequency, inter-frequency and/ or inter-RAT cell re-selection (i.e. applicable for more than one type of cell re-selection but not necessarily all) as well as intra-frequency cell re-selection information other than neighbouring cell related.

*SystemInformationBlockType3* information element

-- ASN1START

SystemInformationBlockType3 ::= SEQUENCE {

cellReselectionInfoCommon SEQUENCE {

q-Hyst ENUMERATED {

dB0, dB1, dB2, dB3, dB4, dB5, dB6, dB8, dB10,

dB12, dB14, dB16, dB18, dB20, dB22, dB24},

speedStateReselectionPars SEQUENCE {

mobilityStateParameters MobilityStateParameters,

q-HystSF SEQUENCE {

sf-Medium ENUMERATED {

dB-6, dB-4, dB-2, dB0},

sf-High ENUMERATED {

dB-6, dB-4, dB-2, dB0}

}

} OPTIONAL -- Need OP

},

cellReselectionServingFreqInfo SEQUENCE {

s-NonIntraSearch ReselectionThreshold OPTIONAL, -- Need OP

threshServingLow ReselectionThreshold,

cellReselectionPriority CellReselectionPriority

},

intraFreqCellReselectionInfo SEQUENCE {

q-RxLevMin Q-RxLevMin,

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

s-IntraSearch ReselectionThreshold OPTIONAL, -- Need OP

allowedMeasBandwidth AllowedMeasBandwidth OPTIONAL, -- Need OP

presenceAntennaPort1 PresenceAntennaPort1,

neighCellConfig NeighCellConfig,

t-ReselectionEUTRA T-Reselection,

t-ReselectionEUTRA-SF SpeedStateScaleFactors OPTIONAL -- Need OP

},

...,

lateNonCriticalExtension OCTET STRING (CONTAINING SystemInformationBlockType3-v10j0-IEs) OPTIONAL,

[[ s-IntraSearch-v920 SEQUENCE {

s-IntraSearchP-r9 ReselectionThreshold,

s-IntraSearchQ-r9 ReselectionThresholdQ-r9

} OPTIONAL, -- Need OP

s-NonIntraSearch-v920 SEQUENCE {

s-NonIntraSearchP-r9 ReselectionThreshold,

s-NonIntraSearchQ-r9 ReselectionThresholdQ-r9

} OPTIONAL, -- Need OP

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

threshServingLowQ-r9 ReselectionThresholdQ-r9 OPTIONAL -- Need OP

]],

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

]],

[[ q-QualMinRSRQ-OnAllSymbols-r12 Q-QualMin-r9 OPTIONAL -- Cond RSRQ

]],

[[ cellReselectionServingFreqInfo-v1310 CellReselectionServingFreqInfo-v1310 OPTIONAL, -- Need OP

redistributionServingInfo-r13 RedistributionServingInfo-r13 OPTIONAL, --Need OR

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

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

]],

[[ cellSelectionInfoCE1-r13 CellSelectionInfoCE1-r13 OPTIONAL -- Need OP

]],

[[ cellSelectionInfoCE1-v1360 CellSelectionInfoCE1-v1360 OPTIONAL -- Cond QrxlevminCE1

]],

[[ cellReselectionInfoCommon-v1460 CellReselectionInfoCommon-v1460 OPTIONAL -- Need OR

]],

[[ cellReselectionInfoHSDN-r15 CellReselectionInfoHSDN-r15 OPTIONAL, -- Need OR

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

crs-IntfMitigNeighCellsCE-r15 ENUMERATED {enabled} OPTIONAL -- Need OP

]],

[[ cellReselectionServingFreqInfo-v1610 CellReselectionServingFreqInfo-v1610 OPTIONAL -- Need OR

]],

[[ t-Service-r17 TimeOffsetUTC-r17 OPTIONAL -- Need OR

]]

}

RedistributionServingInfo-r13 ::= SEQUENCE {

redistributionFactorServing-r13 INTEGER(0..10),

redistributionFactorCell-r13 ENUMERATED{true} OPTIONAL, --Need OP

t360-r13 ENUMERATED {min4, min8, min16, min32,infinity,

spare3,spare2,spare1},

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

}

CellReselectionServingFreqInfo-v1310 ::= SEQUENCE {

cellReselectionSubPriority-r13 CellReselectionSubPriority-r13

}

CellReselectionServingFreqInfo-v1610 ::= SEQUENCE {

altCellReselectionPriority-r16 CellReselectionPriority OPTIONAL, -- Need OR

altCellReselectionSubPriority-r16 CellReselectionSubPriority-r13 OPTIONAL -- Need OR

}

-- Late non critical extensions

SystemInformationBlockType3-v10j0-IEs ::= SEQUENCE {

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

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

nonCriticalExtension SystemInformationBlockType3-v10l0-IEs OPTIONAL

}

SystemInformationBlockType3-v10l0-IEs ::= SEQUENCE {

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

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

nonCriticalExtension SEQUENCE {} OPTIONAL

}

CellReselectionInfoCommon-v1460 ::= SEQUENCE {

s-SearchDeltaP-r14 ENUMERATED {dB6, dB9, dB12, dB15}

}

CellReselectionInfoHSDN-r15 ::= SEQUENCE {

cellEquivalentSize-r15 INTEGER(2..16)

}

-- ASN1STOP

| *SystemInformationBlockType3* field descriptions |
| --- |
| ***allowedMeasBandwidth***  If absent, the value corresponding to the downlink bandwidth indicated by the *dl-Bandwidth* included in *MasterInformationBlock* applies. |
| ***altCellReselectionPriority***  Alternative cell reselection priorities to be used by the UEs for which the *altFreqPriorities* is set to *true* in the *RRCConnectionRelease* message. |
| ***altCellReselectionSubPriority***  Alternative cell reselection sub-priorities to be used by the UEs for which the *altFreqPriorities* is set to *true* in the *RRCConnectionRelease* message. |
| ***cellEquivalentSize***  The number of cell count used for mobility state estimation for this cell as specified in TS 36.304 [4]. |
| ***cellSelectionInfoCE***  Parameters included in coverage enhancement S criteria for BL UEs and UEs in CE, applicable for intra-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, applicable for intra-frequency neighbour cells. E-UTRAN includes this IE only if *cellSelectionInfoCE* in SIB3 is present. | |
| ***cellReselectionInfoCommon***  Cell re-selection information common for cells. |
| ***cellReselectionServingFreqInfo***  Information common for Cell re-selection to inter-frequency and inter-RAT cells. |
| ***crs-IntfMitigNeighCellsCE***  For BL UEs supporting *ce-CRS-IntfMitig*, this field indicates CRS interference mitigation, as specified in TS 36.133 [16], clause 3.6.1.2 and 3.6.1.3, is enabled in any of the intra-frequency neibhour cells, and the UE shall perform intra-frequency neighbour cell RRM measurements in the center 6 PRBs. |
| ***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, applicable for the intra-frequency neighouring E-UTRA cells if the UE selects the frequency band from *freqBandIndicator* in *SystemInformationBlockType1*. If E-UTRAN includes *freqBandInfo-v10l0* it includes the same number of entries, and listed in the same order, as in *freqBandInfo-r10*. |
| ***intraFreqcellReselectionInfo***  Cell re-selection information common for intra-frequency cells. |
| ***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, applicable for the intra-frequency neighouring E-UTRA cells if the UE selects the frequency bands in *multiBandInfoList* (i.e. without suffix) or *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 intra-frequency neighbouring E-UTRA cells. If absent the UE applies the maximum power according to its capability as specified in TS 36.101 [42], clause 6.2.2. This field is ignored by IAB-MT. The IAB-MT applies output power and emissions requirements, as specified in TS 38.174 [107]. |
| ***redistrOnPagingOnly***  If this field is present and the UE is redistribution capable, the UE shall only wait for the paging message to trigger E-UTRAN inter-frequency redistribution procedure as specified in clause 5.2.4.10 of TS 36.304 [4]. |
| ***q-Hyst***  Parameter *Qhyst* in TS 36.304 [4], Value in dB. Value dB1 corresponds to 1 dB, dB2 corresponds to 2 dB and so on. |
| ***q-HystSF***  Parameter "Speed dependent ScalingFactor for *Qhyst*" in TS 36.304 [4]. The sf-Medium and sf-High concern the additional hysteresis to be applied, in Medium and High Mobility state respectively, to *Qhyst* as defined in TS 36.304 [4]. In dB. Value dB-6 corresponds to -6dB, dB-4 corresponds to -4dB and so on. |
| ***q-QualMin***  Parameter "Qqualmin" in TS 36.304 [4], applicable for intra-frequency neighbour cells. 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. |
| ***q-RxLevMin***  Parameter "Qrxlevmin" in TS 36.304 [4], applicable for intra-frequency neighbour cells. |
| ***redistributionFactorCell***  If *redistributionFactorCell* is present, *redistributionFactorServing* is only applicable for the serving cell otherwise it is applicable for serving frequency |
| ***redistributionFactorServing***  Parameter *redistributionFactorServing* in TS 36.304 [4]. |
| ***s-IntraSearch***  Parameter "SIntraSearchP" in TS 36.304 [4]. If the field *s-IntraSearchP* is present, the UE applies the value of *s-IntraSearchP* instead. Otherwise if neither *s-IntraSearch* nor *s-IntraSearchP* is present, the UE applies the (default) value of infinity for SIntraSearchP. |
| ***s-IntraSearchP***  Parameter "SIntraSearchP" in TS 36.304 [4]. See descriptions under *s-IntraSearch*. |
| ***s-IntraSearchQ***  Parameter "SIntraSearchQ" in TS 36.304 [4]. If the field is not present, the UE applies the (default) value of 0 dB for SIntraSearchQ. |
| ***s-NonIntraSearch***  Parameter "SnonIntraSearchP" in TS 36.304 [4]. If the field *s-NonIntraSearchP* is present, the UE applies the value of *s-NonIntraSearchP* instead. Otherwise if neither *s-NonIntraSearch* nor *s-NonIntraSearchP* is present, the UE applies the (default) value of infinity for SnonIntraSearchP. |
| ***s-NonIntraSearchP***  Parameter "SnonIntraSearchP" in TS 36.304 [4]. See descriptions under *s-NonIntraSearch*. |
| ***s-NonIntraSearchQ***  Parameter "SnonIntraSearchQ" in TS 36.304 [4]. If the field is not present, the UE applies the (default) value of 0 dB for SnonIntraSearchQ. |
| ***s-SearchDeltaP***  Parameter "SSearchDeltaP" in TS 36.304 [4]. This parameter is only applicable for UEs supporting relaxed monitoring as specified in TS 36.306 [5]. Value dB6 corresponds to 6 dB, dB9 corresponds to 9 dB and so on. |
| ***speedStateReselectionPars***  Speed dependent reselection parameters, see TS 36.304 [4]. If this field is absent, i.e, *mobilityStateParameters* is also not present, UE behaviour is specified in TS 36.304 [4]. |
| ***t-Service***  Time information on when a NTN quasi-Earth fixed cell is going to stop serving the area it is currently covering, as specified in TS 36.304 [4]. | |
| ***t360***  Parameter "T360" in TS 36.304 [4]. Value *min4* corresponds to 4 minutes, value *min8* corresponds to 8 minutes, and so on. |
| ***threshServingLow***  Parameter "ThreshServing, LowP" in TS 36.304 [4]. |
| ***threshServingLowQ***  Parameter "ThreshServing, 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 |
| --- | --- |
| *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 optionally present, Need OR, if *threshServingLowQ* is present in SIB3; otherwise it is not present. |
| *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. |

#### – *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 exclude-listed cells.

*SystemInformationBlockType4* information element

-- ASN1START

SystemInformationBlockType4 ::= SEQUENCE {

intraFreqNeighCellList IntraFreqNeighCellList OPTIONAL, -- Need OR

intraFreqExcludedCellList IntraFreqExcludedCellList 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-v1610 IntraFreqNeighCellList-v1610 OPTIONAL -- Cond RSS

]]

}

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

IntraFreqNeighCellList-v1610 ::= SEQUENCE (SIZE (1..maxCellIntra)) OF IntraFreqNeighCellInfo-v1610

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

IntraFreqNeighCellInfo ::= SEQUENCE {

physCellId PhysCellId,

q-OffsetCell Q-OffsetRange,

...

}

IntraFreqNeighCellInfo-v1610 ::= SEQUENCE {

rss-MeasPowerBias-r16 RSS-MeasPowerBias-r16

}

IntraFreqExcludedCellList ::= SEQUENCE (SIZE (1..maxExcludedCell)) 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]. |
| ***intraFreqExcludedCellList***  List of exclude-listed intra-frequency neighbouring cells. |
| ***intraFreqNeighCellList***  List of intra-frequency neighbouring cells with specific cell re-selection parameters. *intraFreqNeighCellList-v1610* indicates list of RSS assistance information which is used for the corresponding *physCellId*. If E-UTRAN includes *intraFreqNeighCellList-v1610*, it includes the same number of entries, and listed in the same order, as in *intraFreqNeighCellList* (i.e. without suffix)*.* If *intraFreqNeighCellList-v1610* is absent, measurement based on RSS is not applicable for all the neighbour cells in *intraFreqNeighCellList* (i.e. without suffix). |
| ***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. | |

| 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 OP, 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 for inter-frequency cell re-selection (i.e. information about other E‑UTRA frequencies and inter-frequency neighbouring cells relevant for cell re-selection) and information relevant for E-UTRA and NR idle/inactive measurements. 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-v1610 InterFreqCarrierFreqList-v1610 OPTIONAL, -- Need OR

interFreqCarrierFreqListExt-v1610 InterFreqCarrierFreqListExt-v1610 OPTIONAL, -- Need OR

measIdleConfigSIB-NR-r16 MeasIdleConfigSIB-NR-r16 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-v1610 ::= SEQUENCE (SIZE (1..maxFreq)) OF InterFreqCarrierFreqInfo-v1610

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-v1610 ::= SEQUENCE (SIZE (1..maxFreq)) OF InterFreqCarrierFreqInfo-v1610

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

interFreqExcludedCellList InterFreqExcludedCellList 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

interFreqExcludedCellList-r12 InterFreqExcludedCellList 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-v1610 ::= SEQUENCE {

altCellReselectionPriority-r16 CellReselectionPriority OPTIONAL, -- Need OR

altCellReselectionSubPriority-r16 CellReselectionSubPriority-r13 OPTIONAL, -- Need OR

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

interFreqNeighCellList-v1610 InterFreqNeighCellList-v1610 OPTIONAL -- Cond RSS

}

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

InterFreqNeighCellList-v1610 ::= SEQUENCE (SIZE (1..maxCellInter)) OF InterFreqNeighCellInfo-v1610

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

InterFreqNeighCellInfo ::= SEQUENCE {

physCellId PhysCellId,

q-OffsetCell Q-OffsetRange

}

InterFreqNeighCellInfo-v1610 ::= SEQUENCE {

rss-MeasPowerBias-r16 RSS-MeasPowerBias-r16

}

InterFreqExcludedCellList ::= SEQUENCE (SIZE (1..maxExcludedCell)) 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 |
| --- |
| ***altCellReselectionPriority***  Alternative cell reselection priorities to be used by the UEs for which the *altFreqPriorities* is set to *true* in the *RRCConnectionRelease* message. |
| ***altCellReselectionSubPriority***  Alternative cell reselection sub-priorities to be used by the UEs for which the *altFreqPriorities* is set to *true* in the *RRCConnectionRelease* message. |
| ***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*. |
| ***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*, *InterFreqCarrierFreqList-v1530* and/or *InterFreqCarrierFreqList-v1610*, 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*, *InterFreqCarrierFreqListExt-v1530* and/or *InterFreqCarrierFreqList-v1610,* it includes the same number of entries, and listed in the same order, as in *interFreqCarrierFreqListExt-r12.* |
| ***interFreqExcludedCellList***  List of exclude-listed inter-frequency neighbouring cells. |
| ***interFreqNeighCellList***  List of inter-frequency neighbouring cells with specific cell re-selection parameters. *interFreqNeighCellList-v1610* indicates list of RSS assistance information which is used for the corresponding *physCellId*. If E-UTRAN includes *interFreqNeighCellList-v1610* in *interFreqCarrierFreqList-v1610 / interFreqCarrierFreqListExt-v1610*, it includes the same number of entries, and listed in the same order, as in *interFreqNeighCellList* (i.e. without suffix) / *interFreqNeighCellList-r12.* If *interFreqNeighCellList-v1610* is absent in *interFreqCarrierFreqList-v1610/ interFreqCarrierFreqListExt-v1610*, measurement based on RSS is not applicable for all the neighbour cells in *interFreqNeighCellList* (i.e. without suffix) / *interFreqNeighCellList-r12*. |
| ***interFreqNeighHSDN-CellList***  List of inter-frequency neighbouring HSDN cells as specified in TS 36.304 [4]. |
| ***measIdleConfigSIB***  Indicates E-UTRA measurement configuration to be stored and used by the UE while in RRC\_IDLE or RRC\_INACTIVE. |
| ***measIdleConfigSIB-NR***  Indicates the NR measurement configuration to be stored and used by the UE while in RRC\_IDLE or RRC\_INACTIVE. |
| ***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. This field is ignored by IAB-MT. The IAB-MT applies output power and emissions requirements, as specified in TS 38.174 [107]. |
| ***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-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. |
| ***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 OP, if *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. |

#### – *SystemInformationBlockType6*

The IE *SystemInformationBlockType6* contains information relevant only for inter-RAT cell re-selection i.e. information about UTRA frequencies and UTRA neighbouring cells relevant for cell re-selection. The IE includes cell re-selection parameters common for a frequency.

*SystemInformationBlockType6* information element

-- ASN1START

SystemInformationBlockType6 ::= SEQUENCE {

carrierFreqListUTRA-FDD CarrierFreqListUTRA-FDD OPTIONAL, -- Need OR

carrierFreqListUTRA-TDD CarrierFreqListUTRA-TDD OPTIONAL, -- Need OR

t-ReselectionUTRA T-Reselection,

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

...,

lateNonCriticalExtension OCTET STRING (CONTAINING SystemInformationBlockType6-v8h0-IEs) OPTIONAL,

[[ carrierFreqListUTRA-FDD-v1250 SEQUENCE (SIZE (1..maxUTRA-FDD-Carrier)) OF

CarrierFreqInfoUTRA-v1250 OPTIONAL, -- Cond UTRA-FDD

carrierFreqListUTRA-TDD-v1250 SEQUENCE (SIZE (1..maxUTRA-TDD-Carrier)) OF

CarrierFreqInfoUTRA-v1250 OPTIONAL, -- Cond UTRA-TDD

carrierFreqListUTRA-FDD-Ext-r12 CarrierFreqListUTRA-FDD-Ext-r12 OPTIONAL, -- Cond UTRA-FDD

carrierFreqListUTRA-TDD-Ext-r12 CarrierFreqListUTRA-TDD-Ext-r12 OPTIONAL -- Cond UTRA-TDD

]]

}

SystemInformationBlockType6-v8h0-IEs ::= SEQUENCE {

carrierFreqListUTRA-FDD-v8h0 SEQUENCE (SIZE (1..maxUTRA-FDD-Carrier)) OF CarrierFreqInfoUTRA-FDD-v8h0 OPTIONAL, -- Cond UTRA-FDD

nonCriticalExtension SEQUENCE {} OPTIONAL

}

CarrierFreqInfoUTRA-v1250 ::= SEQUENCE {

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

}

CarrierFreqListUTRA-FDD ::= SEQUENCE (SIZE (1..maxUTRA-FDD-Carrier)) OF CarrierFreqUTRA-FDD

CarrierFreqUTRA-FDD ::= SEQUENCE {

carrierFreq ARFCN-ValueUTRA,

cellReselectionPriority CellReselectionPriority OPTIONAL, -- Need OP

threshX-High ReselectionThreshold,

threshX-Low ReselectionThreshold,

q-RxLevMin INTEGER (-60..-13),

p-MaxUTRA INTEGER (-50..33),

q-QualMin INTEGER (-24..0),

...,

[[ threshX-Q-r9 SEQUENCE {

threshX-HighQ-r9 ReselectionThresholdQ-r9,

threshX-LowQ-r9 ReselectionThresholdQ-r9

} OPTIONAL -- Cond RSRQ

]]

}

CarrierFreqInfoUTRA-FDD-v8h0 ::= SEQUENCE {

multiBandInfoList SEQUENCE (SIZE (1..maxMultiBands)) OF FreqBandIndicator-UTRA-FDD OPTIONAL -- Need OR

}

CarrierFreqListUTRA-FDD-Ext-r12 ::= SEQUENCE (SIZE (1..maxUTRA-FDD-Carrier)) OF

CarrierFreqUTRA-FDD-Ext-r12

CarrierFreqUTRA-FDD-Ext-r12 ::= SEQUENCE {

carrierFreq-r12 ARFCN-ValueUTRA,

cellReselectionPriority-r12 CellReselectionPriority OPTIONAL, -- Need OP

threshX-High-r12 ReselectionThreshold,

threshX-Low-r12 ReselectionThreshold,

q-RxLevMin-r12 INTEGER (-60..-13),

p-MaxUTRA-r12 INTEGER (-50..33),

q-QualMin-r12 INTEGER (-24..0),

threshX-Q-r12 SEQUENCE {

threshX-HighQ-r12 ReselectionThresholdQ-r9,

threshX-LowQ-r12 ReselectionThresholdQ-r9

} OPTIONAL, -- Cond RSRQ

multiBandInfoList-r12 SEQUENCE (SIZE (1..maxMultiBands)) OF FreqBandIndicator-UTRA-FDD OPTIONAL, -- Need OR

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

...

}

CarrierFreqListUTRA-TDD ::= SEQUENCE (SIZE (1..maxUTRA-TDD-Carrier)) OF CarrierFreqUTRA-TDD

CarrierFreqUTRA-TDD ::= SEQUENCE {

carrierFreq ARFCN-ValueUTRA,

cellReselectionPriority CellReselectionPriority OPTIONAL, -- Need OP

threshX-High ReselectionThreshold,

threshX-Low ReselectionThreshold,

q-RxLevMin INTEGER (-60..-13),

p-MaxUTRA INTEGER (-50..33),

...

}

CarrierFreqListUTRA-TDD-Ext-r12 ::= SEQUENCE (SIZE (1..maxUTRA-TDD-Carrier)) OF

CarrierFreqUTRA-TDD-r12

CarrierFreqUTRA-TDD-r12 ::= SEQUENCE {

carrierFreq-r12 ARFCN-ValueUTRA,

cellReselectionPriority-r12 CellReselectionPriority OPTIONAL, -- Need OP

threshX-High-r12 ReselectionThreshold,

threshX-Low-r12 ReselectionThreshold,

q-RxLevMin-r12 INTEGER (-60..-13),

p-MaxUTRA-r12 INTEGER (-50..33),

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

...

}

FreqBandIndicator-UTRA-FDD ::= INTEGER (1..86)

-- ASN1STOP

| *SystemInformationBlockType6* field descriptions |
| --- |
| ***carrierFreqListUTRA-FDD***  List of carrier frequencies of UTRA FDD. E-UTRAN does not configure more than one entry for the same physical frequency regardless of the ARFCN used to indicate this. If E-UTRAN includes *carrierFreqListUTRA-FDD-v8h0* and/or *carrierFreqListUTRA-FDD-v1250*, it includes the same number of entries, and listed in the same order, as in *carrierFreqListUTRA-FDD* (i.e. without suffix). See Annex D for more descriptions. |
| ***carrierFreqListUTRA-FDD-Ext***  List of additional carrier frequencies of UTRA FDD. E-UTRAN does not configure more than one entry for the same physical frequency regardless of the ARFCN used to indicate this. EUTRAN may include *carrierFreqListUTRA-FDD-Ext* even if *carrierFreqListUTRA-FDD* (i.e without suffix) does not include *maxUTRA-FDD-Carrier* entries. |
| ***carrierFreqListUTRA-TDD***  List of carrier frequencies of UTRA TDD. E-UTRAN does not configure more than one entry for the same physical frequency regardless of the ARFCN used to indicate this If E-UTRAN includes *carrierFreqListUTRA-TDD-v1250*, it includes the same number of entries, and listed in the same order, as in *carrierFreqListUTRA-TDD* (i.e. without suffix). |
| ***carrierFreqListUTRA-TDD-Ext***  List of additional carrier frequencies of UTRA TDD. E-UTRAN does not configure more than one entry for the same physical frequency regardless of the ARFCN used to indicate this. EUTRAN may include *carrierFreqListUTRA-TDD-Ext* even if *carrierFreqListUTRA-TDD* (i.e without suffix) does not include *maxUTRA-TDD-Carrier* entries. |
| ***multiBandInfoList***  Indicates the list of frequency bands in addition to the band represented by carrierFreq in the *CarrierFreqUTRA-FDD* for which UTRA cell reselection parameters are common. |
| ***p-MaxUTRA***  The maximum allowed transmission power on the (uplink) carrier frequency, see TS 25.304 [40]. In dBm |
| ***q-QualMin***  Parameter "Qqualmin" in TS 25.304 [40]. Actual value = field value [dB]. |
| ***q-RxLevMin***  Parameter "Qrxlevmin" in TS 25.304 [40]. Actual value = field value \* 2+1 [dBm]. |
| ***reducedMeasPerformance***  Value *TRUE* indicates that the UTRA carrier frequency is configured for reduced measurement performance, see TS 36.133 [16]. If the field is not included, the UTRA carrier frequency is configured for normal measurement performance, see TS 36.133 [16]. |
| ***t-ReselectionUTRA***  Parameter "TreselectionUTRAN" in TS 36.304 [4]. |
| ***t-ReselectionUTRA-SF***  Parameter "Speed dependent ScalingFactor for TreselectionUTRA" in TS 36.304 [4]. If the field is not present, the UE behaviour is 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]. |

| Conditional presence | Explanation |
| --- | --- |
| *RSRQ* | The field is mandatory present if the *threshServingLowQ* is present in *systemInformationBlockType3*; otherwise it is not present. |
| *UTRA-FDD* | The field is optionally present, need OR, if the *carrierFreqListUTRA-FDD* is present. Otherwise it is not present. |
| *UTRA-TDD* | The field is optionally present, need OR, if the *carrierFreqListUTRA-TDD* is present. Otherwise it is not present. |

#### – *SystemInformationBlockType7*

The IE *SystemInformationBlockType7* contains information relevant only for inter-RAT cell re-selection i.e. information about GERAN frequencies relevant for cell re-selection. The IE includes cell re-selection parameters for each frequency.

*SystemInformationBlockType7* information element

-- ASN1START

SystemInformationBlockType7 ::= SEQUENCE {

t-ReselectionGERAN T-Reselection,

t-ReselectionGERAN-SF SpeedStateScaleFactors OPTIONAL, -- Need OR

carrierFreqsInfoList CarrierFreqsInfoListGERAN OPTIONAL, -- Need OR

...,

lateNonCriticalExtension OCTET STRING OPTIONAL

}

CarrierFreqsInfoListGERAN ::= SEQUENCE (SIZE (1..maxGNFG)) OF CarrierFreqsInfoGERAN

CarrierFreqsInfoGERAN ::= SEQUENCE {

carrierFreqs CarrierFreqsGERAN,

commonInfo SEQUENCE {

cellReselectionPriority CellReselectionPriority OPTIONAL, -- Need OP

ncc-Permitted BIT STRING (SIZE (8)),

q-RxLevMin INTEGER (0..45),

p-MaxGERAN INTEGER (0..39) OPTIONAL, -- Need OP

threshX-High ReselectionThreshold,

threshX-Low ReselectionThreshold

},

...

}

-- ASN1STOP

| *SystemInformationBlockType7* field descriptions |
| --- |
| ***carrierFreqs***  The list of GERAN carrier frequencies organised into one group of GERAN carrier frequencies. |
| ***carrierFreqsInfoList***  Provides a list of neighbouring GERAN carrier frequencies, which may be monitored for neighbouring GERAN cells. The GERAN carrier frequencies are organised in groups and the cell reselection parameters are provided per group of GERAN carrier frequencies. |
| ***commonInfo***  Defines the set of cell reselection parameters for the group of GERAN carrier frequencies. |
| ***ncc-Permitted***  Field encoded as a bit map, where bit N is set to "0" if a BCCH carrier with NCC = N-1 is not permitted for monitoring and set to "1" if the BCCH carrier with NCC = N-1 is permitted for monitoring; N = 1 to 8; bit 1 of the bitmap is the leading bit of the bit string. |
| ***p-MaxGERAN***  Maximum allowed transmission power for GERAN on an uplink carrier frequency, see TS 45.008 [28]. Value in dBm. Applicable for the neighbouring GERAN cells on this carrier frequency. If *pmaxGERAN* is absent, the maximum power according to the UE capability is used. |
| ***q-RxLevMin***  Parameter "Qrxlevmin" in TS 36.304 [4], minimum required RX level in the GSM cell. The actual value of Qrxlevmin in dBm = (field value \* 2) − 115. |
| ***threshX-High***  Parameter "ThreshX, HighP" in TS 36.304 [4]. |
| ***threshX-Low***  Parameter "ThreshX, LowP" in TS 36.304 [4]. |
| ***t-ReselectionGERAN***  Parameter "TreselectionGERAN" in TS 36.304 [4]. |
| ***t-ReselectionGERAN-SF***  Parameter "Speed dependent ScalingFactor for TreselectionGERAN" in TS 36.304 [4]. If the field is not present, the UE behaviour is specified in TS 36.304 [4]. |

#### – *SystemInformationBlockType8*

The IE *SystemInformationBlockType8* contains information relevant only for inter-RAT cell re-selection i.e. information about CDMA2000 frequencies and CDMA2000 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.

*SystemInformationBlockType8* information element

-- ASN1START

SystemInformationBlockType8 ::= SEQUENCE {

systemTimeInfo SystemTimeInfoCDMA2000 OPTIONAL, -- Need OR

searchWindowSize INTEGER (0..15) OPTIONAL, -- Need OR

parametersHRPD SEQUENCE {

preRegistrationInfoHRPD PreRegistrationInfoHRPD,

cellReselectionParametersHRPD CellReselectionParametersCDMA2000 OPTIONAL -- Need OR

} OPTIONAL, -- Need OR

parameters1XRTT SEQUENCE {

csfb-RegistrationParam1XRTT CSFB-RegistrationParam1XRTT OPTIONAL, -- Need OP

longCodeState1XRTT BIT STRING (SIZE (42)) OPTIONAL, -- Need OR

cellReselectionParameters1XRTT CellReselectionParametersCDMA2000 OPTIONAL -- Need OR

} OPTIONAL, -- Need OR

...,

lateNonCriticalExtension OCTET STRING OPTIONAL,

[[ csfb-SupportForDualRxUEs-r9 BOOLEAN OPTIONAL, -- Need OR

cellReselectionParametersHRPD-v920 CellReselectionParametersCDMA2000-v920 OPTIONAL, -- Cond NCL-HRPD

cellReselectionParameters1XRTT-v920 CellReselectionParametersCDMA2000-v920 OPTIONAL, -- Cond NCL-1XRTT

csfb-RegistrationParam1XRTT-v920 CSFB-RegistrationParam1XRTT-v920 OPTIONAL, -- Cond REG-1XRTT

ac-BarringConfig1XRTT-r9 AC-BarringConfig1XRTT-r9 OPTIONAL -- Cond REG-1XRTT

]],

[[ csfb-DualRxTxSupport-r10 ENUMERATED {true} OPTIONAL -- Cond REG-1XRTT

]],

[[ sib8-PerPLMN-List-r11 SIB8-PerPLMN-List-r11 OPTIONAL -- Need OR

]]

}

CellReselectionParametersCDMA2000 ::= SEQUENCE {

bandClassList BandClassListCDMA2000,

neighCellList NeighCellListCDMA2000,

t-ReselectionCDMA2000 T-Reselection,

t-ReselectionCDMA2000-SF SpeedStateScaleFactors OPTIONAL -- Need OP

}

CellReselectionParametersCDMA2000-r11 ::= SEQUENCE {

bandClassList BandClassListCDMA2000,

neighCellList-r11 SEQUENCE (SIZE (1..16)) OF NeighCellCDMA2000-r11,

t-ReselectionCDMA2000 T-Reselection,

t-ReselectionCDMA2000-SF SpeedStateScaleFactors OPTIONAL -- Need OP

}

CellReselectionParametersCDMA2000-v920 ::= SEQUENCE {

neighCellList-v920 NeighCellListCDMA2000-v920

}

NeighCellListCDMA2000 ::= SEQUENCE (SIZE (1..16)) OF NeighCellCDMA2000

NeighCellCDMA2000 ::= SEQUENCE {

bandClass BandclassCDMA2000,

neighCellsPerFreqList NeighCellsPerBandclassListCDMA2000

}

NeighCellCDMA2000-r11 ::= SEQUENCE {

bandClass BandclassCDMA2000,

neighFreqInfoList-r11 SEQUENCE (SIZE (1..16)) OF NeighCellsPerBandclassCDMA2000-r11

}

NeighCellsPerBandclassListCDMA2000 ::= SEQUENCE (SIZE (1..16)) OF NeighCellsPerBandclassCDMA2000

NeighCellsPerBandclassCDMA2000 ::= SEQUENCE {

arfcn ARFCN-ValueCDMA2000,

physCellIdList PhysCellIdListCDMA2000

}

NeighCellsPerBandclassCDMA2000-r11 ::= SEQUENCE {

arfcn ARFCN-ValueCDMA2000,

physCellIdList-r11 SEQUENCE (SIZE (1..40)) OF PhysCellIdCDMA2000

}

NeighCellListCDMA2000-v920 ::= SEQUENCE (SIZE (1..16)) OF NeighCellCDMA2000-v920

NeighCellCDMA2000-v920 ::= SEQUENCE {

neighCellsPerFreqList-v920 NeighCellsPerBandclassListCDMA2000-v920

}

NeighCellsPerBandclassListCDMA2000-v920 ::= SEQUENCE (SIZE (1..16)) OF NeighCellsPerBandclassCDMA2000-v920

NeighCellsPerBandclassCDMA2000-v920 ::= SEQUENCE {

physCellIdList-v920 PhysCellIdListCDMA2000-v920

}

PhysCellIdListCDMA2000 ::= SEQUENCE (SIZE (1..16)) OF PhysCellIdCDMA2000

PhysCellIdListCDMA2000-v920 ::= SEQUENCE (SIZE (0..24)) OF PhysCellIdCDMA2000

BandClassListCDMA2000 ::= SEQUENCE (SIZE (1..maxCDMA-BandClass)) OF BandClassInfoCDMA2000

BandClassInfoCDMA2000 ::= SEQUENCE {

bandClass BandclassCDMA2000,

cellReselectionPriority CellReselectionPriority OPTIONAL, -- Need OP

threshX-High INTEGER (0..63),

threshX-Low INTEGER (0..63),

...

}

AC-BarringConfig1XRTT-r9 ::= SEQUENCE {

ac-Barring0to9-r9 INTEGER (0..63),

ac-Barring10-r9 INTEGER (0..7),

ac-Barring11-r9 INTEGER (0..7),

ac-Barring12-r9 INTEGER (0..7),

ac-Barring13-r9 INTEGER (0..7),

ac-Barring14-r9 INTEGER (0..7),

ac-Barring15-r9 INTEGER (0..7),

ac-BarringMsg-r9 INTEGER (0..7),

ac-BarringReg-r9 INTEGER (0..7),

ac-BarringEmg-r9 INTEGER (0..7)

}

SIB8-PerPLMN-List-r11 ::= SEQUENCE (SIZE (1..maxPLMN-r11)) OF SIB8-PerPLMN-r11

SIB8-PerPLMN-r11 ::= SEQUENCE {

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

parametersCDMA2000-r11 CHOICE {

explicitValue ParametersCDMA2000-r11,

defaultValue NULL

}

}

ParametersCDMA2000-r11 ::= SEQUENCE {

systemTimeInfo-r11 CHOICE {

explicitValue SystemTimeInfoCDMA2000,

defaultValue NULL

} OPTIONAL, -- Need OR

searchWindowSize-r11 INTEGER (0..15),

parametersHRPD-r11 SEQUENCE {

preRegistrationInfoHRPD-r11 PreRegistrationInfoHRPD,

cellReselectionParametersHRPD-r11 CellReselectionParametersCDMA2000-r11 OPTIONAL -- Need OR

} OPTIONAL, -- Need OR

parameters1XRTT-r11 SEQUENCE {

csfb-RegistrationParam1XRTT-r11 CSFB-RegistrationParam1XRTT OPTIONAL, -- Need OP

csfb-RegistrationParam1XRTT-Ext-r11 CSFB-RegistrationParam1XRTT-v920 OPTIONAL, -- Cond REG-1XRTT-PerPLMN

longCodeState1XRTT-r11 BIT STRING (SIZE (42)) OPTIONAL, -- Cond PerPLMN-LC

cellReselectionParameters1XRTT-r11 CellReselectionParametersCDMA2000-r11 OPTIONAL, -- Need OR

ac-BarringConfig1XRTT-r11 AC-BarringConfig1XRTT-r9 OPTIONAL, -- Cond REG-1XRTT-PerPLMN

csfb-SupportForDualRxUEs-r11 BOOLEAN OPTIONAL, -- Need OR

csfb-DualRxTxSupport-r11 ENUMERATED {true} OPTIONAL -- Cond REG-1XRTT-PerPLMN

} OPTIONAL, -- Need OR

...

}

-- ASN1STOP

| *SystemInformationBlockType8* field descriptions |
| --- |
| ***ac-BarringConfig1XRTT***  Contains the access class barring parameters the UE uses to calculate the access class barring factor, see C.S0097 [53]. |
| ***ac-Barring0to9***  Parameter used for calculating the access class barring factor for access overload classes 0 through 9. It is the parameter "PSIST" in C.S0004 [34] for access overload classes 0 through 9. |
| ***ac-BarringEmg***  Parameter used for calculating the access class barring factor for emergency calls and emergency message transmissions for access overload classes 0 through 9. It is the parameter "PSIST\_EMG" in C.S0004 [34]. |
| ***ac-BarringMsg***  Parameter used for modifying the access class barring factor for message transmissions. It is the parameter "MSG\_PSIST" in C.S0004 [34]. |
| ***ac-BarringN***  Parameter used for calculating the access class barring factor for access overload class N (N = 10 to 15). It is the parameter "PSIST" in C.S0004 [34] for access overload class N. |
| ***ac-BarringReg***  Parameter used for modifying the access class barring factor for autonomous registrations. It is the parameter "REG\_PSIST" in C.S0004 [34]. |
| ***bandClass***  Identifies the Frequency Band in which the Carrier can be found. Details can be found in C.S0057 [24, Table 1.5]. |
| ***bandClassList***  List of CDMA2000 frequency bands. |
| ***cellReselectionParameters1XRTT***  Cell reselection parameters applicable only to CDMA2000 1xRTT system. |
| ***cellReselectionParameters1XRTT-Ext***  Cell reselection parameters applicable for cell reselection to CDMA2000 1XRTT system. |
| ***cellReselectionParameters1XRTT-v920***  Cell reselection parameters applicable for cell reselection to CDMA2000 1XRTT system. The field is not present if *cellReselectionParameters1XRTT* is not present; otherwise it is optionally present. |
| ***cellReselectionParametersHRPD***  Cell reselection parameters applicable for cell reselection to CDMA2000 HRPD system |
| ***cellReselectionParametersHRPD-Ext***  Cell reselection parameters applicable for cell reselection to CDMA2000 HRPD system. |
| ***cellReselectionParametersHRPD-v920***  Cell reselection parameters applicable for cell reselection to CDMA2000 HRPD system. The field is not present if *cellReselectionParametersHRPD* is not present; otherwise it is optionally present. |
| ***csfb-DualRxTxSupport***  Value TRUE indicates that the network supports dual Rx/Tx enhanced 1xCSFB, which enables UEs capable of dual Rx/Tx enhanced 1xCSFB to switch off their 1xRTT receiver/transmitter while camped in E-UTRAN [51]. |
| ***csfb-RegistrationParam1XRTT***  Contains the parameters the UE will use to determine if it should perform a CDMA2000 1xRTT Registration/Re-Registration. This field is included if either CSFB or enhanced CS fallback to CDMA2000 1xRTT is supported. |
| **csfb-SupportForDualRxUEs**  Value TRUE indicates that the network supports dual Rx CSFB [51]. |
| ***longCodeState1XRTT***  The state of long code generation registers in CDMA2000 1XRTT system as defined in C.S0002 [12], clause 1.3, at ms, where *t* equals to the *cdma-SystemTime*. This field is required for reporting CGI for 1xRTT, SRVCC handover and enhanced CS fallback to CDMA2000 1xRTT operation. Otherwise this IE is not needed. This field is excluded when estimating changes in system information, i.e. changes of *longCodeState1XRTT* should neither result in system information change notifications nor in a modification of *systemInfoValueTag* in SIB1. |
| ***neighCellList***  List of CDMA2000 neighbouring cells. The total number of neighbouring cells in neighCellList for each RAT (1XRTT or HRPD) is limited to 32. |
| ***neighCellList-v920***  Extended List of CDMA2000 neighbouring cells. The combined total number of CDMA2000 neighbouring cells in both *neighCellList* and *neighCellList-v920* is limited to 32 for HRPD and 40 for 1xRTT. |
| ***neighCellsPerFreqList***  List of carrier frequencies and neighbour cell ids in each frequency within a CDMA2000 Band, see C.S0002 [12] or C.S0024 [26]. |
| ***neighCellsPerFreqList-v920***  Extended list of neighbour cell ids, in the same CDMA2000 Frequency Band as the corresponding instance in "NeighCellListCDMA2000". |
| ***parameters1XRTT***  Parameters applicable for interworking with CDMA2000 1XRTT system. |
| ***parametersCDMA2000***  Provides the corresponding SIB8 parameters for the CDMA2000 network associated with the PLMN indicated in *plmn-Identity*. A choice is used to indicate whether for this PLMN the parameters are signalled explicitly or set to the (default) values common for all PLMNs i.e. the values not included in *sib8-PerPLMN-List*. |
| ***parametersHRPD***  Parameters applicable only for interworking with CDMA2000 HRPD systems. |
| ***physCellIdList***  Identifies the list of CDMA2000 cell ids, see C.S0002 [12] or C.S0024 [26]. |
| ***physCellIdList-v920***  Extended list of CDMA2000 cell ids, in the same CDMA2000 ARFCN as the corresponding instance in "NeighCellsPerBandclassCDMA2000". |
| ***plmn-Identity***  Indicates the PLMN associated with this CDMA2000 network. 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. A PLMN which identity is not indicated in the *sib8-PerPLMN-List*, does not support inter-working with CDMA2000. |
| ***preRegistrationInfoHRPD***  The CDMA2000 HRPD Pre-Registration Information tells the UE if it should pre-register with the CDMA2000 HRPD network and identifies the Pre-registration zone to the UE. |
| ***searchWindowSize***  The search window size is a CDMA2000 parameter to be used to assist in searching for the neighbouring pilots. For values see C.S0005 [25], Table 2.6.6.2.1-1, and C.S0024 [26], Table 8.7.6.2-4. This field is required for a UE with *rx-ConfigHRPD*= *single* and/ or *rx-Config1XRTT*= *single* to perform handover, cell re-selection, UE measurement based redirection and enhanced 1xRTT CS fallback from E-UTRAN to CDMA2000 according to this specification and TS 36.304 [4]. |
| ***sib8-PerPLMN-List***  This field provides the values for the interworking CDMA2000 networks corresponding, if any, to the UE's RPLMN. |
| ***systemTimeInfo***  Information on CDMA2000 system time. This field is required for a UE with *rx-ConfigHRPD*= *single* and/ or *rx-Config1XRTT*= *single* to perform handover, cell re-selection, UE measurement based redirection and enhanced 1xRTT CS fallback from E-UTRAN to CDMA2000 according to this specification and TS 36.304 [4]. This field is excluded when estimating changes in system information, i.e. changes of *systemTimeInfo* should neither result in system information change notifications nor in a modification of *systemInfoValueTag* in SIB1.  For the field included in *ParametersCDMA2000*, a choice is used to indicate whether for this PLMN the parameters are signalled explicitly or set to the (default) value common for all PLMNs i.e. the value not included in *sib8-PerPLMN-List*. |
| ***threshX-High***  Parameter "ThreshX, HighP" in TS 36.304 [4]. This specifies the high threshold used in reselection towards this CDMA2000 band class expressed as an unsigned binary number equal to FLOOR (-2 x 10 x log10 Ec/Io) in units of 0.5 dB, as defined in C.S0005 [25]. |
| ***threshX-Low***  Parameter "ThreshX, LowP" in TS 36.304 [4]. This specifies the low threshold used in reselection towards this CDMA2000 band class expressed as an unsigned binary number equal to FLOOR (-2 x 10 x log10 Ec/Io) in units of 0.5 dB, as defined in C.S0005 [25]. |
| ***t-ReselectionCDMA2000***  Parameter "TreselectionCDMA\_HRPD" or "TreselectionCDMA\_1xRTT" in TS 36.304 [4]. |
| ***t-ReselectionCDMA2000-SF***  Parameter "Speed dependent ScalingFactor for TreselectionCDMA-HRPD" or TreselectionCDMA-1xRTT" in TS 36.304 [4]. If the field is not present, the UE behaviour is specified in TS 36.304 [4]. |

| Conditional presence | Explanation |
| --- | --- |
| *NCL-1XRTT* | The field is optional present, need OR, if *cellReselectionParameters1xRTT* is present; otherwise it is not present. |
| *NCL-HRPD* | The field is optional present, need OR, if *cellReselectionParametersHRPD* is present; otherwise it is not present. |
| *PerPLMN-LC* | The field is optional present, need OR, when *systemTimeInfo* is included in *SIB8PerPLMN* for this CDMA2000 network; otherwise it is not present. |
| *REG-1XRTT* | The field is optional present, need OR, if *csfb-RegistrationParam1XRTT* is present; otherwise it is not present. |
| *REG-1XRTT-PerPLMN* | The field is optional present, need OR, if *csfb-RegistrationParam1XRTT* is included in *SIB8PerPLMN* for this CDMA2000 network; otherwise it is not present. |

#### – *SystemInformationBlockType9*

The IE *SystemInformationBlockType9* contains a home eNB name (HNB Name).

*SystemInformationBlockType9* information element

-- ASN1START

SystemInformationBlockType9 ::= SEQUENCE {

hnb-Name OCTET STRING (SIZE(1..48)) OPTIONAL, -- Need OR

...,

lateNonCriticalExtension OCTET STRING OPTIONAL

}

-- ASN1STOP

| *SystemInformationBlockType9* field descriptions |
| --- |
| ***hnb-Name***  Carries the name of the home eNB, coded in UTF-8 with variable number of bytes per character, see TS 22.011 [10]. |

#### – *SystemInformationBlockType10*

The IE *SystemInformationBlockType10* contains an ETWS primary notification.

*SystemInformationBlockType10* information element

-- ASN1START

SystemInformationBlockType10 ::= SEQUENCE {

messageIdentifier BIT STRING (SIZE (16)),

serialNumber BIT STRING (SIZE (16)),

warningType OCTET STRING (SIZE (2)),

dummy OCTET STRING (SIZE (50)) OPTIONAL, -- Need OP

...,

lateNonCriticalExtension OCTET STRING OPTIONAL

}

-- ASN1STOP

| *SystemInformationBlockType10* field descriptions |
| --- |
| ***messageIdentifier***  Identifies the source and type of ETWS notification. The leading bit (which is equivalent to the leading bit of the equivalent IE defined in TS 36.413 [39], clause 9.2.1.44) contains bit 7 of the first octet of the equivalent IE, defined in and encoded according to TS 23.041 [37], clause 9.4.3.2.1, while the trailing bit contains bit 0 of the second octet of the same equivalent IE. |
| ***serialNumber***  Identifies variations of an ETWS notification. The leading bit (which is equivalent to the leading bit of the equivalent IE defined in TS 36.413 [39], clause 9.2.1.45), contains bit 7 of the first octet of the equivalent IE, defined in and encoded according to TS 23.041 [37], clause 9.4.3.2.2, while the trailing bit contains bit 0 of the second octet of the same equivalent IE. |
| ***dummy***  This field is not used in the specification. If received it shall be ignored by the UE. |
| ***warningType***  Identifies the warning type of the ETWS primary notification and provides information on emergency user alert and UE popup. The first octet (which is equivalent to the first octet of the equivalent IE defined in TS 36.413 [39], clause 9.2.1.50) contains the first octet of the equivalent IE defined in and encoded according to TS 23.041 [37], clause 9.3.24, and so on. |

#### – *SystemInformationBlockType11*

The IE *SystemInformationBlockType11* contains an ETWS secondary notification.

*SystemInformationBlockType11* information element

-- ASN1START

SystemInformationBlockType11 ::= SEQUENCE {

messageIdentifier BIT STRING (SIZE (16)),

serialNumber BIT STRING (SIZE (16)),

warningMessageSegmentType ENUMERATED {notLastSegment, lastSegment},

warningMessageSegmentNumber INTEGER (0..63),

warningMessageSegment OCTET STRING,

dataCodingScheme OCTET STRING (SIZE (1)) OPTIONAL, -- Cond Segment1

...,

lateNonCriticalExtension OCTET STRING OPTIONAL

}

-- ASN1STOP

| *SystemInformationBlockType11* field descriptions |
| --- |
| ***dataCodingScheme***  Identifies the alphabet/coding and the language applied variations of an ETWS notification. The octet (which is equivalent to the octet of the equivalent IE defined in TS 36.413 [39], clause 9.2.1.52), contains the octet of the equivalent IE defined in TS 23.041 [37], clause 9.4.3.2.3, and encoded according to TS 23.038 [38]. |
| ***messageIdentifier***  Identifies the source and type of ETWS notification. The leading bit (which is equivalent to the leading bit of the equivalent IE defined in TS 36.413 [39], clause 9.2.1.44), contains bit 7 of the first octet of the equivalent IE, defined in and encoded according to TS 23.041 [37], clause 9.4.3.2.1, while the trailing bit contains bit 0 of second octet of the same equivalent IE. |
| ***serialNumber***  Identifies variations of an ETWS notification. The leading bit (which is equivalent to the leading bit of the equivalent IE defined in TS 36.413 [39], clause 9.2.1.45) contains bit 7 of the first octet of the equivalent IE, defined in and encoded according to TS 23.041 [37], clause 9.4.3.2.2, while the trailing bit contains bit 0 of second octet of the same equivalent IE. |
| ***warningMessageSegment***  Carries a segment of the *Warning Message Contents* IE defined in TS 36.413 [39], clause 9.2.1.53. The first octet of the *Warning Message Contents* IE is equivalent to the first octet of the *CB data* IE defined in and encoded according to TS 23.041 [37], clause 9.4.2.2.5, and so on. |
| ***warningMessageSegmentNumber***  Segment number of the ETWS warning message segment contained in the SIB. A segment number of zero corresponds to the first segment, one corresponds to the second segment, and so on. |
| ***warningMessageSegmentType***  Indicates whether the included ETWS warning message segment is the last segment or not. |

| Conditional presence | Explanation |
| --- | --- |
| *Segment1* | The field is mandatory present in the first segment of SIB11, otherwise it is not present. |

#### – *SystemInformationBlockType12*

The IE *SystemInformationBlockType12* contains a CMAS notification.

*SystemInformationBlockType12* information element

-- ASN1START

SystemInformationBlockType12-r9 ::= SEQUENCE {

messageIdentifier-r9 BIT STRING (SIZE (16)),

serialNumber-r9 BIT STRING (SIZE (16)),

warningMessageSegmentType-r9 ENUMERATED {notLastSegment, lastSegment},

warningMessageSegmentNumber-r9 INTEGER (0..63),

warningMessageSegment-r9 OCTET STRING,

dataCodingScheme-r9 OCTET STRING (SIZE (1)) OPTIONAL, -- Cond Segment1

lateNonCriticalExtension OCTET STRING OPTIONAL,

...,

[[ warningAreaCoordinatesSegment-r15 OCTET STRING OPTIONAL -- Need OR

]]

}

-- ASN1STOP

| *SystemInformationBlockType12* field descriptions |
| --- |
| ***dataCodingScheme***  Identifies the alphabet/coding and the language applied variations of a CMAS notification. The octet (which is equivalent to the octet of the equivalent IE defined in TS 36.413 [39], clause 9.2.1.52), contains the octet of the equivalent IE defined in TS 23.041 [37], clause 9.4.3.2.3, and encoded according to TS 23.038 [38]. |
| ***messageIdentifier***  Identifies the source and type of CMAS notification. The leading bit (which is equivalent to the leading bit of the equivalent IE defined in TS 36.413 [39], clause 9.2.1.44) contains bit 7 of the first octet of the equivalent IE, defined in and encoded according to TS 23.041 [37], clause 9.4.3.2.1, while the trailing bit contains bit 0 of second octet of the same equivalent IE. |
| ***serialNumber***  Identifies variations of a CMAS notification. The leading bit (which is equivalent to the leading bit of the equivalent IE defined in TS 36.413 [39], clause 9.2.1.45), contains bit 7 of the first octet of the equivalent IE, defined in and encoded according to TS 23.041 [37], clause 9.4.3.2.2, while the trailing bit contains bit 0 of second octet of the same equivalent IE. |
| ***warningAreaCoordinatesSegment***  If present, carries a segment, with one or more octets, of the geographical area where the CMAS warning message is valid as defined in [98]. The first octet of the first *warningAreaCoordinatesSegment* is equivalent to the first octet of Warning Area Coordinates IE defined in and encoded according to TS 23.041 [37] and so on. |
| ***warningMessageSegment***  Carries a segment, with one or more octets, of the *Warning Message Contents* IE defined in TS 36.413 [39]. The first octet of the *Warning Message Contents* IE is equivalent to the first octet of the *CB data* IE defined in and encoded according to TS 23.041 [37], clause 9.4.2.2.5, and so on. |
| ***warningMessageSegmentNumber***  Segment number of the CMAS warning message segment contained in the SIB. A segment number of zero corresponds to the first segment, one corresponds to the second segment, and so on. If warning area coordinates are provided for the warning message, then this field applies to both warning message segment and warning area coordinates segment. |
| ***warningMessageSegmentType***  Indicates whether the included CMAS warning message segment is the last segment or not. If warning area coordinates are provided for the warning message, then this field applies to both warning message segment and warning area coordinates segment. |

| Conditional presence | Explanation |
| --- | --- |
| *Segment1* | The field is mandatory present in the first segment of SIB12, otherwise it is not present. |

#### – *SystemInformationBlockType13*

The IE *SystemInformationBlockType13* contains the information required to acquire the MBMS control information associated with one or more MBSFN areas.

*SystemInformationBlockType13* information element

-- ASN1START

SystemInformationBlockType13-r9 ::= SEQUENCE {

mbsfn-AreaInfoList-r9 MBSFN-AreaInfoList-r9,

notificationConfig-r9 MBMS-NotificationConfig-r9,

lateNonCriticalExtension OCTET STRING OPTIONAL,

...,

[[

notificationConfig-v1430 MBMS-NotificationConfig-v1430 OPTIONAL

]],

[[

mbsfn-AreaInfoList-r16 MBSFN-AreaInfoList-r16 OPTIONAL -- Need OR

]],

[[

mbsfn-AreaInfoList-r17 MBSFN-AreaInfoList-r17 OPTIONAL -- Cond Ded15or25PRB

]]

}

-- ASN1STOP

| *SystemInformationBlockType13* field descriptions |
| --- |
| ***notificationConfig***  Indicates the MBMS notification related configuration parameters. The UE shall ignore this field when *dl-Bandwidth* included in *MasterInformationBlock* is set to n6. |

| Conditional presence | Explanation |
| --- | --- |
| *Ded15or25PRB* | The field is optionally present, need OR, for an MBMS-dedicated cell when *dl-Bandwidth-MBMS* is set to n15 or n25. Otherwise the field is not present. |

#### – *SystemInformationBlockType14*

The IE *SystemInformationBlockType14* contains the EAB parameters.

*SystemInformationBlockType14* information element

-- ASN1START

SystemInformationBlockType14-r11 ::= SEQUENCE {

eab-Param-r11 CHOICE {

eab-Common-r11 EAB-Config-r11,

eab-PerPLMN-List-r11 SEQUENCE (SIZE (1..maxPLMN-r11)) OF EAB-ConfigPLMN-r11

} OPTIONAL, -- Need OR

lateNonCriticalExtension OCTET STRING OPTIONAL,

...,

[[ eab-PerRSRP-r15 ENUMERATED {thresh0, thresh1, thresh2, thresh3} OPTIONAL -- Need OR

]]

}

EAB-ConfigPLMN-r11 ::= SEQUENCE {

eab-Config-r11 EAB-Config-r11 OPTIONAL -- Need OR

}

EAB-Config-r11 ::= SEQUENCE {

eab-Category-r11 ENUMERATED {a, b, c},

eab-BarringBitmap-r11 BIT STRING (SIZE (10))

}

-- ASN1STOP

| *SystemInformationBlockType14* field descriptions |
| --- |
| ***eab-BarringBitmap***  Extended access class barring for AC 0-9. The first/ leftmost bit is for AC 0, the second bit is for AC 1, and so on. |
| ***eab-Category***  Indicates the category of UEs for which EAB applies. Value *a* corresponds to all UEs, value *b* corresponds to the UEs that are neither in their HPLMN nor in a PLMN that is equivalent to it, and value *c* corresponds to the UEs that are neither in the PLMN listed as most preferred PLMN of the country where the UEs are roaming in the operator-defined PLMN selector list on the USIM, nor in their HPLMN nor in a PLMN that is equivalent to their HPLMN, see TS 22.011 [10]. |
| ***eab-Common***  The EAB parameters applicable for all PLMN(s). |
| ***eab-PerPLMN-List***  The EAB parameters per PLMN, listed in the same order as the PLMN(s) listed across the *plmn-IdentityList* fields in *SystemInformationBlockType1*. |
| ***eab-PerRSRP***  Access barring per RSRP. Value *thresh0* means access to the cell is barred when in enhanced coverage as specified in TS 36.304 [4] and does not apply to UEs satisfying S criteria for normal coverage. Value *thresh1* is compared to the first entry configured in *rsrp-ThresholdsPrachInfoList*, value thresh2 is compared to the second entry configured in *rsrp-ThresholdsPrachInfoList* and so on. |

#### – *SystemInformationBlockType15*

The IE *SystemInformationBlockType15* contains the MBMS Service Area Identities (SAI) of the current and/ or neighbouring carrier frequencies.

*SystemInformationBlockType15* information element

-- ASN1START

SystemInformationBlockType15-r11 ::= SEQUENCE {

mbms-SAI-IntraFreq-r11 MBMS-SAI-List-r11 OPTIONAL, -- Need OR

mbms-SAI-InterFreqList-r11 MBMS-SAI-InterFreqList-r11 OPTIONAL, -- Need OR

lateNonCriticalExtension OCTET STRING OPTIONAL,

...,

[[ mbms-SAI-InterFreqList-v1140 MBMS-SAI-InterFreqList-v1140 OPTIONAL -- Cond InterFreq

]],

[[ mbms-IntraFreqCarrierType-r14 MBMS-CarrierType-r14 OPTIONAL, -- Need OR

mbms-InterFreqCarrierTypeList-r14

MBMS-InterFreqCarrierTypeList-r14 OPTIONAL -- Need OR

]]

}

MBMS-SAI-List-r11 ::= SEQUENCE (SIZE (1..maxSAI-MBMS-r11)) OF MBMS-SAI-r11

MBMS-SAI-r11 ::= INTEGER (0..65535)

MBMS-SAI-InterFreqList-r11 ::= SEQUENCE (SIZE (1..maxFreq)) OF MBMS-SAI-InterFreq-r11

MBMS-SAI-InterFreqList-v1140 ::= SEQUENCE (SIZE (1..maxFreq)) OF MBMS-SAI-InterFreq-v1140

MBMS-SAI-InterFreq-r11 ::= SEQUENCE {

dl-CarrierFreq-r11 ARFCN-ValueEUTRA-r9,

mbms-SAI-List-r11 MBMS-SAI-List-r11

}

MBMS-SAI-InterFreq-v1140 ::= SEQUENCE {

multiBandInfoList-r11 MultiBandInfoList-r11 OPTIONAL -- Need OR

}

MBMS-InterFreqCarrierTypeList-r14 ::= SEQUENCE (SIZE (1..maxFreq)) OF MBMS-CarrierType-r14

MBMS-CarrierType-r14 ::= SEQUENCE {

carrierType-r14 ENUMERATED {mbms, fembmsMixed, fembmsDedicated},

frameOffset-r14 INTEGER (0..3) OPTIONAL -- Need OR

}

-- ASN1STOP

| *SystemInformationBlockType15* field descriptions |
| --- |
| ***carrierType***  Indicates whether the carrier is pre-Rel-14 MBMS carrier (*mbms*) or FeMBMS/Unicast mixed carrier (*fembmsMixed*) or MBMS-dedicated carrier (*fembmsDedicated*). |
| ***frameOffset***  For MBMS-dedicated carrier, the *frameOffset* gives the radio frame which contains PBCH by SFN mod 4 = *frameOffset*. |
| ***mbms-InterFreqCarrierTypeList***  Indicates whether this is an feMBMS carrier. The field is included only if *mbms-SAI-InterFreqList-r11* is included. The number of entries is the same in both fields and carrier type relates to the frequency indicated in *mbms-SAI-InterFreqList-r11* in the corresponding entry index. |
| ***mbms-IntraFreqCarrierType***  Contains indication whether the carrier is pre-Rel-14 MBMS carrier, FeMBMS/Unicast mixed carrier or MBMS-dedicated carrier. |
| ***mbms-SAI-InterFreqList***  Contains a list of neighboring frequencies including additional bands, if any, that provide MBMS services and the corresponding MBMS SAIs. |
| ***mbms-SAI-IntraFreq***  Contains the list of MBMS SAIs for the current frequency. A duplicate MBMS SAI indicates that this and all following SAIs are not offered by this cell but only by neighbour cells on the current frequency. For MBMS service continuity, the UE shall use all MBMS SAIs listed in *mbms-SAI-IntraFreq* to derive the MBMS frequencies of interest. |
| ***mbms-SAI-List***  Contains a list of MBMS SAIs for a specific frequency. |
| ***multiBandInfoList***  A list of additional frequency bands applicable for the cells participating in the MBSFN transmission. |

| Conditional presence | Explanation |
| --- | --- |
| *InterFreq* | The field is optionally present, need OR, if the *mbms-SAI-InterFreqList-r11* is present. Otherwise it is not present. |

#### – *SystemInformationBlockType16*

The IE *SystemInformationBlockType16* contains information related to GPS time and Coordinated Universal Time (UTC). The UE may use the parameters provided in this system information block to obtain the UTC, the GPS and the local time.

NOTE: The UE may use the time information for numerous purposes, possibly involving upper layers e.g. to assist GPS initialisation, to synchronise the UE clock (a.o. to determine MBMS session start/ stop).

*SystemInformationBlockType16* information element

-- ASN1START

SystemInformationBlockType16-r11 ::= SEQUENCE {

timeInfo-r11 SEQUENCE {

timeInfoUTC-r11 INTEGER (0..549755813887),

dayLightSavingTime-r11 BIT STRING (SIZE (2)) OPTIONAL, -- Need OR

leapSeconds-r11 INTEGER (-127..128) OPTIONAL, -- Need OR

localTimeOffset-r11 INTEGER (-63..64) OPTIONAL -- Need OR

} OPTIONAL, -- Need OR

lateNonCriticalExtension OCTET STRING OPTIONAL,

...,

[[ timeReferenceInfo-r15 TimeReferenceInfo-r15 OPTIONAL -- Need OR

]]

}

-- ASN1STOP

| *SystemInformationBlockType16* field descriptions |
| --- |
| ***dayLightSavingTime***  It indicates if and how daylight saving time (DST) is applied to obtain the local time. The semantics is the same as the semantics of the *Daylight Saving Time* IE in TS 24.301 [35] and TS 24.008 [49]. The first/leftmost bit of the bit string contains the b2 of octet 3, i.e. the value part of the *Daylight Saving Time* IE, and the second bit of the bit string contains b1 of octet 3. |
| ***leapSeconds***  Number of leap seconds offset between GPS Time and UTC. UTC and GPS time are related i.e. GPS time -*leapSeconds* = UTC time. |
| ***localTimeOffset***  Offset between UTC and local time in units of 15 minutes. Actual value = field value \* 15 minutes. Local time of the day is calculated as UTC time + *localTimeOffset*. |
| ***timeInfoUTC***  Coordinated Universal Time corresponding to the SFN boundary at or immediately after the ending boundary of the SI-window in which *SystemInformationBlockType16* is transmitted. The field counts the number of UTC seconds in 10 ms units since 00:00:00 on Gregorian calendar date 1 January, 1900 (midnight between Sunday, December 31, 1899 and Monday, January 1, 1900). NOTE 1.  This field is excluded when estimating changes in system information, i.e. changes of *timeInfoUTC* should neither result in system information change notifications nor in a modification of *systemInfoValueTag* in SIB1. |

NOTE 1: The UE may use this field together with the leapSeconds field to obtain GPS time as follows: GPS Time (in seconds) = timeInfoUTC (in seconds) - 2,524,953,600 (seconds) + leapSeconds, where 2,524,953,600 is the number of seconds between 00:00:00 on Gregorian calendar date 1 January, 1900 and 00:00:00 on Gregorian calendar date 6 January, 1980 (start of GPS time).

#### – *SystemInformationBlockType17*

The IE *SystemInformationBlockType17* contains information relevant for traffic steering between E-UTRAN and WLAN.

*SystemInformationBlockType17* information element

-- ASN1START

SystemInformationBlockType17-r12 ::= SEQUENCE {

wlan-OffloadInfoPerPLMN-List-r12 SEQUENCE (SIZE (1..maxPLMN-r11)) OF

WLAN-OffloadInfoPerPLMN-r12 OPTIONAL, -- Need OR

lateNonCriticalExtension OCTET STRING OPTIONAL,

...

}

WLAN-OffloadInfoPerPLMN-r12 ::= SEQUENCE {

wlan-OffloadConfigCommon-r12 WLAN-OffloadConfig-r12 OPTIONAL, -- Need OR

wlan-Id-List-r12 WLAN-Id-List-r12 OPTIONAL, -- Need OR

...

}

WLAN-Id-List-r12 ::= SEQUENCE (SIZE (1..maxWLAN-Id-r12)) OF WLAN-Identifiers-r12

WLAN-Identifiers-r12 ::= SEQUENCE {

ssid-r12 OCTET STRING (SIZE (1..32)) OPTIONAL, -- Need OR

bssid-r12 OCTET STRING (SIZE (6)) OPTIONAL, -- Need OR

hessid-r12 OCTET STRING (SIZE (6)) OPTIONAL, -- Need OR

...

}

-- ASN1STOP

| *SystemInformationBlockType17* field descriptions |
| --- |
| ***bssid***  Basic Service Set Identifier (BSSID) defined in IEEE 802.11-2012 [67]. |
| ***hessid***  Homogenous Extended Service Set Identifier (HESSID) defined in IEEE 802.11-2012 [67]. |
| ***ssid***  Service Set Identifier (SSID) defined in IEEE 802.11-2012 [67]. |
| ***wlan-OffloadInfoPerPLMN-List***  The WLAN offload configuration per PLMN includes the same number of entries, listed in the same order as the PLMN(s) listed across the *plmn-IdentityList* fields in *SystemInformationBlockType1*. |

#### – *SystemInformationBlockType18*

The IE *SystemInformationBlockType18* indicates E-UTRAN supports the sidelink UE information procedure and may contain sidelink communication related resource configuration information.

*SystemInformationBlockType18* information element

-- ASN1START

SystemInformationBlockType18-r12 ::= SEQUENCE {

commConfig-r12 SEQUENCE {

commRxPool-r12 SL-CommRxPoolList-r12,

commTxPoolNormalCommon-r12 SL-CommTxPoolList-r12 OPTIONAL, -- Need OR

commTxPoolExceptional-r12 SL-CommTxPoolList-r12 OPTIONAL, -- Need OR

commSyncConfig-r12 SL-SyncConfigList-r12 OPTIONAL -- Need OR

} OPTIONAL, -- Need OR

lateNonCriticalExtension OCTET STRING OPTIONAL,

...,

[[ commTxPoolNormalCommonExt-r13 SL-CommTxPoolListExt-r13 OPTIONAL, -- Need OR

commTxResourceUC-ReqAllowed-r13 ENUMERATED {true} OPTIONAL, -- Need OR

commTxAllowRelayCommon-r13 ENUMERATED {true} OPTIONAL -- Need OR

]]

}

-- ASN1STOP

| *SystemInformationBlockType18* field descriptions |
| --- |
| ***commRxPool***  Indicates the resources by which the UE is allowed to receive sidelink communication while in RRC\_IDLE and while in RRC\_CONNECTED. |
| ***commSyncConfig***  Indicates the configuration by which the UE is allowed to receive and transmit synchronisation information. E-UTRAN configures *commSyncConfig* including *txParameters* when configuring UEs by dedicated signalling to transmit synchronisation information. |
| ***commTxAllowRelayCommon***  Indicates whether the UE is allowed to transmit relay related sidelink communication data using the transmission pools included in *SystemInformationBlockType18* i.e. either via *commTxPoolNormalCommon*, *commTxPoolNormalCommonExt* or via *commTxPoolExceptional*. |
| ***commTxPoolExceptional***  Indicates the resources by which the UE is allowed to transmit sidelink communication in exceptional conditions, as specified in 5.10.4. |
| ***commTxPoolNormalCommon***  Indicates the resources by which the UE is allowed to transmit sidelink communication while in RRC\_IDLE or when in RRC\_CONNECTED while transmitting sidelink via a frequency other than the primary. |
| ***commTxPoolNormalCommonExt***  Indicates transmission resource pool(s) in addition to the pool(s) indicated by field *commTxPoolNormalCommon*, by which the UE is allowed to transmit sidelink communication while in RRC\_IDLE or when in RRC\_CONNECTED while transmitting sidelink via a frequency other than the primary. E-UTRAN configures *commTxPoolNormalCommonExt* only when it configures *commTxPoolNormalCommon*. |
| ***commTxResourceUC-ReqAllowed***  Indicates whether the UE is allowed to request transmission pools for non-relay related one-to-one sidelink communication. |

#### – *SystemInformationBlockType19*

The IE *SystemInformationBlockType19* indicates E-UTRAN supports the sidelink UE information procedure and may contain sidelink discovery related resource configuration information.

*SystemInformationBlockType19* information element

-- ASN1START

SystemInformationBlockType19-r12 ::= SEQUENCE {

discConfig-r12 SEQUENCE {

discRxPool-r12 SL-DiscRxPoolList-r12,

discTxPoolCommon-r12 SL-DiscTxPoolList-r12 OPTIONAL, -- Need OR

discTxPowerInfo-r12 SL-DiscTxPowerInfoList-r12 OPTIONAL, -- Cond Tx

discSyncConfig-r12 SL-SyncConfigList-r12 OPTIONAL -- Need OR

} OPTIONAL, -- Need OR

discInterFreqList-r12 SL-CarrierFreqInfoList-r12 OPTIONAL, -- Need OR

lateNonCriticalExtension OCTET STRING OPTIONAL,

...,

[[ discConfig-v1310 SEQUENCE {

discInterFreqList-v1310 SL-CarrierFreqInfoList-v1310 OPTIONAL, -- Need OR

gapRequestsAllowedCommon ENUMERATED {true} OPTIONAL -- Need OR

} OPTIONAL, -- Need OR

discConfigRelay-r13 SEQUENCE {

relayUE-Config-r13 SL-DiscConfigRelayUE-r13,

remoteUE-Config-r13 SL-DiscConfigRemoteUE-r13

} OPTIONAL, -- Need OR

discConfigPS-13 SEQUENCE {

discRxPoolPS-r13 SL-DiscRxPoolList-r12,

discTxPoolPS-Common-r13 SL-DiscTxPoolList-r12 OPTIONAL -- Need OR

} OPTIONAL -- Need OR

]]

}

SL-CarrierFreqInfoList-r12 ::= SEQUENCE (SIZE (1..maxFreq)) OF SL-CarrierFreqInfo-r12

SL-CarrierFreqInfoList-v1310 ::= SEQUENCE (SIZE (1..maxFreq)) OF SL-CarrierFreqInfo-v1310

SL-CarrierFreqInfo-r12::= SEQUENCE {

carrierFreq-r12 ARFCN-ValueEUTRA-r9,

plmn-IdentityList-r12 PLMN-IdentityList4-r12 OPTIONAL -- Need OP

}

SL-DiscConfigRelayUE-r13 ::= SEQUENCE {

threshHigh-r13 RSRP-RangeSL4-r13 OPTIONAL, -- Need OR

threshLow-r13 RSRP-RangeSL4-r13 OPTIONAL, -- Need OR

hystMax-r13 ENUMERATED {dB0, dB3, dB6, dB9, dB12, dBinf} OPTIONAL, -- Cond ThreshHigh

hystMin-r13 ENUMERATED {dB0, dB3, dB6, dB9, dB12} OPTIONAL -- Cond ThreshLow

}

SL-DiscConfigRemoteUE-r13 ::= SEQUENCE {

threshHigh-r13 RSRP-RangeSL4-r13 OPTIONAL, -- Need OR

hystMax-r13 ENUMERATED {dB0, dB3, dB6, dB9, dB12} OPTIONAL, -- Cond ThreshHigh

reselectionInfoIC-r13 ReselectionInfoRelay-r13

}

ReselectionInfoRelay-r13 ::= SEQUENCE {

q-RxLevMin-r13 Q-RxLevMin,

-- Note that the mapping of invidual values may be different for PC5, but the granularity/

-- number of values is same as for Uu

filterCoefficient-r13 FilterCoefficient,

minHyst-r13 ENUMERATED {dB0, dB3,

dB6, dB9, dB12, dBinf} OPTIONAL -- Need OR

}

SL-CarrierFreqInfo-v1310::= SEQUENCE {

discResourcesNonPS-r13 SL-ResourcesInterFreq-r13 OPTIONAL, -- Need OR

discResourcesPS-r13 SL-ResourcesInterFreq-r13 OPTIONAL, -- Need OR

discConfigOther-r13 SL-DiscConfigOtherInterFreq-r13 OPTIONAL, -- Need OR

...

}

PLMN-IdentityList4-r12 ::= SEQUENCE (SIZE (1..maxPLMN-r11)) OF PLMN-IdentityInfo2-r12

PLMN-IdentityInfo2-r12 ::= CHOICE {

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

plmnIdentity-r12 PLMN-Identity

}

SL-DiscTxResourcesInterFreq-r13 ::= CHOICE {

acquireSI-FromCarrier-r13 NULL,

discTxPoolCommon-r13 SL-DiscTxPoolList-r12,

requestDedicated-r13 NULL,

noTxOnCarrier-r13 NULL

}

SL-DiscConfigOtherInterFreq-r13::= SEQUENCE {

txPowerInfo-r13 SL-DiscTxPowerInfoList-r12 OPTIONAL, -- Cond Tx

refCarrierCommon-r13 ENUMERATED {pCell} OPTIONAL, -- Need OR

discSyncConfig-r13 SL-SyncConfigListNFreq-r13 OPTIONAL, -- Need OR

discCellSelectionInfo-r13 CellSelectionInfoNFreq-r13 OPTIONAL -- Need OR

}

SL-ResourcesInterFreq-r13 ::= SEQUENCE {

discRxResourcesInterFreq-r13 SL-DiscRxPoolList-r12 OPTIONAL, -- Need OR

discTxResourcesInterFreq-r13 SL-DiscTxResourcesInterFreq-r13 OPTIONAL -- Need OR

}

-- ASN1STOP

| *SystemInformationBlockType19* field descriptions |
| --- |
| ***discCellSelectionInfo***  Parameters that may be used by the UE to select/ reselect a cell on the concerned non serving frequency. If absent, the UE acquires the information from the target cell on the concerned frequency. See TS 36.304 [4], clause 11.4. |
| ***discInterFreqList***  Indicates the neighbouring frequencies on which sidelink discovery announcement is supported. May also provide further information i.e. reception resource pool and/ or transmission resource pool, or an indication how resources could be obtained. |
| ***discRxPool***  Indicates the resources by which the UE is allowed to receive non-PS related sidelink discovery announcements while in RRC\_IDLE and while in RRC\_CONNECTED. |
| ***discRxPoolPS***  Indicates the resources by which the UE is allowed to receive PS related sidelink discovery announcements while in RRC\_IDLE and while in RRC\_CONNECTED. |
| ***discRxResourcesInterFreq***  Indicates the resource pool configuration for receiving discovery announcements on a carrier frequency. |
| ***discSyncConfig***  Indicates the configuration by which the UE is allowed to receive and transmit synchronisation information. E-UTRAN configures *discSyncConfig* including *txParameters* when configuring UEs by dedicated signalling to transmit synchronisation information. |
| ***discTxPoolCommon***  Indicates the resources by which the UE is allowed to transmit non-PS related sidelink discovery announcements while in RRC\_IDLE. |
| ***discTxPoolPS-Common***  Indicates the resources by which the UE is allowed to transmit PS related sidelink discovery announcements while in RRC\_IDLE. |
| ***discTxResourcesInterFreq***  For the concerned frequency, either provides the UE with a pool of sidelink discovery announcement transmission resources the UE is allowed to use while in RRC\_IDLE, or indicates whether such transmission is allowed, and if so how the UE may obtain the required resources. Value *noTxOnCarrier* indicates that the UE is not allowed to transmit sidelink discovery announcements on the concerned frequency. Value *acquireSI-FromCarrier* indicates that the required resources are to be obtained by autonomously acquiring SIB19 and other relevant SIBs from the concerned frequency. Value *requestDedicated* indicates, that for the concerned carrier, the required sidelink discovery resources are to be obtained by means of a dedicated resource request using the *SidelinkUEInformation* message. |
| ***plmn-IdentityList***  List of PLMN identities for the neighbouring frequency indicated by *carrierFreq*. Absence of the field indicates the same PLMN identities as listed across the *plmn-IdentityList* fields (without suffix) in *SystemInformationBlockType1*. |
| ***plmn-Index***  Index of the corresponding entry across the *plmn-IdentityList* fields (without suffix) within *SystemInformationBlockType1*. |
| ***refCarrierCommon***  Indicates if the PCell (RRC\_CONNECTED)/ serving cell (RRC\_IDLE) is to be used as reference for DL measurements and synchronization, instead of the DL frequency paired with the one used to transmit sidelink discovery announcements on, see TS 36.213 [23], clause 14.3.1. |
| ***reselectionInfoIC***  Includes the parameters used by the UE when selecting/ reselecting a sidelink relay UE. |
| ***SL-CarrierFreqInfoList-v1310***  If included, the UE shall include the same number of entries, and listed in the same order, as in *SL-CarrierFreqInfoList-r12*. |
| ***threshHigh, threshLow (relayUE)***  Indicates when a sidelink remote UE or sidelink relay UE that is in network coverage may use the broadcast PS related sidelink discovery Tx resource pool, if broadcast, or request Tx resources by dedicated signalling otherwise. For remote UEs, this parameter is used similarly for relay related sidelink communication. |

| Conditional presence | Explanation |
| --- | --- |
| *ThreshHigh* | The field is mandatory present if *threshHigh* is included in the corresponding IE. Otherwise the field is not present and UE shall delete any existing value for this field. |
| *ThreshLow* | The field is mandatory present if *threshLow* is included. Otherwise the field is not present UE shall delete any existing value for this field. |
| *Tx* | The field is mandatory present if *discTxPoolCommon* is included. Otherwise the field is optional present, need OR. |

#### – *SystemInformationBlockType20*

The IE *SystemInformationBlockType20* contains the information required to acquire the control information associated transmission of MBMS using SC-PTM.

*SystemInformationBlockType20* information element

-- ASN1START

SystemInformationBlockType20-r13 ::= SEQUENCE {

sc-mcch-RepetitionPeriod-r13 ENUMERATED {rf2, rf4, rf8, rf16, rf32, rf64, rf128, rf256},

sc-mcch-Offset-r13 INTEGER (0..10),

sc-mcch-FirstSubframe-r13 INTEGER (0..9),

sc-mcch-duration-r13 INTEGER (2..9) OPTIONAL,

sc-mcch-ModificationPeriod-r13 ENUMERATED {rf2, rf4, rf8, rf16, rf32, rf64, rf128, rf256,

rf512, rf1024, r2048, rf4096, rf8192, rf16384, rf32768,

rf65536},

lateNonCriticalExtension OCTET STRING OPTIONAL,

...,

[[ br-BCCH-Config-r14 SEQUENCE {

dummy ENUMERATED {rf1},

dummy2 ENUMERATED {rf1},

mpdcch-Narrowband-SC-MCCH-r14 INTEGER (1..maxAvailNarrowBands-r13),

mpdcch-NumRepetition-SC-MCCH-r14 ENUMERATED {r1, r2, r4, r8, r16,

r32, r64, r128, r256},

mpdcch-StartSF-SC-MCCH-r14 CHOICE {

fdd-r14 ENUMERATED {v1, v1dot5, v2, v2dot5, v4,

v5, v8, v10},

tdd-r14 ENUMERATED {v1, v2, v4, v5, v8, v10, v20}

},

mpdcch-PDSCH-HoppingConfig-SC-MCCH-r14 ENUMERATED {off, ce-ModeA, ce-ModeB},

sc-mcch-CarrierFreq-r14 ARFCN-ValueEUTRA-r9,

sc-mcch-Offset-BR-r14 INTEGER (0..10),

sc-mcch-RepetitionPeriod-BR-r14 ENUMERATED {rf32, rf128, rf512, rf1024,

rf2048, rf4096, rf8192, rf16384},

sc-mcch-ModificationPeriod-BR-r14 ENUMERATED { rf32, rf128, rf256, rf512, rf1024,

rf2048, rf4096, rf8192, rf16384, rf32768,

rf65536, rf131072, rf262144, rf524288,

rf1048576}

} OPTIONAL, -- Need OR

sc-mcch-SchedulingInfo-r14 SC-MCCH-SchedulingInfo-r14 OPTIONAL, -- Need OP

pdsch-maxNumRepetitionCEmodeA-SC-MTCH-r14

ENUMERATED { r16, r32 } OPTIONAL, -- Need OR

pdsch-maxNumRepetitionCEmodeB-SC-MTCH-r14

ENUMERATED {

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

r1536, r2048} OPTIONAL -- Need OR

]],

[[ sc-mcch-RepetitionPeriod-v1470 ENUMERATED {rf1} OPTIONAL, -- Need OR

sc-mcch-ModificationPeriod-v1470 ENUMERATED {rf1} OPTIONAL -- Need OR

]]

}

SC-MCCH-SchedulingInfo-r14::= SEQUENCE {

onDurationTimerSCPTM-r14 ENUMERATED {psf10, psf20, psf100, psf300,

psf500, psf1000, psf1200, psf1600},

drx-InactivityTimerSCPTM-r14 ENUMERATED {psf0, psf1, psf2, psf4, psf8, psf16,

psf32, psf64, psf128, psf256, ps512,

psf1024, psf2048, psf4096, psf8192, psf16384},

schedulingPeriodStartOffsetSCPTM-r14 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),

sf2048 INTEGER(0..2047),

sf4096 INTEGER(0..4095),

sf8192 INTEGER(0..8191)

},

...

}

-- ASN1STOP

| ***SystemInformationBlockType20* field descriptions** |
| --- |
| ***br-BCCH-Config-r14***  The field is present if *SystemInformationBlockType20* is sent on BR-BCCH. Otherwise the field is absent. |
| ***dummy***  This field is not used in the specification. If received it shall be ignored by the UE. |
| ***drx-InactivityTimerSCPTM***  Timer for listening to SC-MCCH scheduling in TS 36.321 [6]. Value in number of MPDCCH sub-frames. Value psf0 corresponds to 0 MPDCCH sub-frame, psf1 corresponds to 1 MPDCCH sub-frame and so on. |
| ***mpdcch-Narrowband-SC-MCCH***  Narrowband for MPDCCH for SC-MCCH, see TS 36.213 [23]. |
| ***mpdcch-NumRepetitions-SC-MCCH***  The maximum number of MPDCCH repetitions the UE needs to monitor for SC-MCCH, see TS 36.213 [23]. |
| ***mpdcch-StartSF-SC-MCCH***  Configuration of the starting subframes of the MPDCCH search space for SC-MCCH, see TS 36.213 [23]. |
| ***mpdcch-PDSCH-HoppingConfig-SC-MCCH***  Frequency hopping configuration for MPDCCH/PDSCH for SC-MCCH, see TS 36.213 [23]. |
| ***onDurationTimerSCPTM***  Indicates the duration in subframes during which SC-MCCH may be scheduled in MPDCCH sub-frames, see TS 36.321 [6]. |
| ***pdsch-maxNumRepetitionCEmodeA-SC-MTCH***  Maximum value to indicate the set of PDSCH repetition numbers for SC-MTCH to UEs in CE mode A, see TS 36.213 [23]. |
| ***pdsch-maxNumRepetitionCEmodeB-SC-MTCH***  Maximum value to indicate the set of PDSCH repetition numbers for SC-MTCH CE to UEs in mode B, see TS 36.213 [23]. |
| ***schedulingPeriodStartOffsetSCPTM***  *SCPTM-SchedulingCycle* and *SCPTM-SchedulingOffset* in TS 36.321 [6]. The value of *SCPTM-SchedulingCycle* is in number of sub-frames. Value sf10 corresponds to 10 sub-frames, sf20 corresponds to 20 sub-frames and so on. The value of *SCPTM-SchedulingOffset* is in number of sub-frames. |
| ***sc-mcch-CarrierFreq***  Downlink carrier used for all multicast SC-MCCH transmissions. |
| ***sc-mcch-duration***  Indicates, starting from the subframe indicated by *sc-mcch-FirstSubframe*, the duration in subframes during which SC-MCCH may be scheduled in PDCCH sub-frames, see TS 36.321 [6]. Absence of this IE means that SC-MCCH is only scheduled in the subframe indicated by *sc-mcch-FirstSubframe*. |
| ***sc-mcch-ModificationPeriod***  Defines periodically appearing boundaries, i.e. radio frames for which SFN mod *sc-mcch-ModificationPeriod* = 0. The contents of different transmissions of SC-MCCH information can only be different if there is at least one such boundary in-between them. Value rf2 corresponds to 2 radio frames, value rf4 corresponds to 4 radio frames and so on. In case sc-mcch-ModificationPeriod-v1470 is configured, the UE shall ignore the configuration of *sc-mcch-ModificationPeriod-r13*. |
| ***sc-mcch-ModificationPeriod-BR***  Defines periodically appearing boundaries for BL UE or UE in CE, i.e. radio frames for which (H-SFN\*1024 + SFN) mod *sc-mcch-ModificationPeriod-BR* = 0 if hyperSFN is present in *SystemInformationBlockType1-BR* or radio frames for which SFN mod *sc-mcchModificationPeriod-BR* = 0 otherwise.The contents of different transmissions of SC-MCCH information can only be different if there is at least one such boundary in-between them. Value rf32 corresponds to 32 radio frames, value rf128 corresponds to 128 radio frames and so on. |
| ***sc-mcch-FirstSubframe***  Indicates the first subframe in which SC-MCCH is scheduled |
| ***sc-mcch-Offset***  Indicates, together with the *sc-mcch-RepetitionPeriod*, the radio frames in which SC-MCCH is scheduled i.e. SC-MCCH is scheduled in radio frames for which: SFN mod sc-*mcch-RepetitionPeriod* = *sc-mcch-Offset*. |
| ***sc-mcch-Offset-BR***  Indicates, together with the *sc-mcch-RepetitionPeriod-BR*, the boundary of the SC-MCCH repetition period for BL UE or UE in CE: (H-SFN\*1024 + SFN) mod *sc-mcch-RepetitionPeriod-BR* = *sc-mcch-Offset-BR* if hyperSFN is present in *SystemInformationBlockType1-*BR or radio frames for which (SFN mod mod *sc-mcch-RepetitionPeriod-BR*) = *sc-mcch-Offset-BR* otherwise. |
| ***sc-mcch-RepetitionPeriod***  Defines the interval between transmissions of SC-MCCH information, in radio frames. Value rf2 corresponds to 2 radio frames, rf4 corresponds to 4 radio frames and so on. In case *sc-mcch-RepetitionPeriod-v1470* is configured, the UE shall ignore the configuration of *sc-mcch-RepetitionPeriod-r13*. |
| ***sc-mcch-RepetitionPeriod-BR***  Defines the interval between transmissions of SC-MCCH information for BL UE or UE in CE, in radio frames. Value rf32 corresponds to 32 radio frames, rf128 corresponds to 128 radio frames and so on. |
| ***sc-mcch-SchedulingInfo***  DRX information for the SC-MCCH. If this field is absent, DRX is not used for SC-MCCH reception. |

#### – *SystemInformationBlockType21*

The IE *SystemInformationBlockType21* contains V2X sidelink communication configuration.

*SystemInformationBlockType21* information element

-- ASN1START

SystemInformationBlockType21-r14 ::= SEQUENCE {

sl-V2X-ConfigCommon-r14 SL-V2X-ConfigCommon-r14 OPTIONAL, -- Need OR

lateNonCriticalExtension OCTET STRING OPTIONAL,

...,

[[ anchorCarrierFreqListNR-r16 SL-NR-AnchorCarrierFreqList-r16 OPTIONAL -- Need OR

]]

}

SL-V2X-ConfigCommon-r14 ::= SEQUENCE {

v2x-CommRxPool-r14 SL-CommRxPoolListV2X-r14 OPTIONAL, -- Need OR

v2x-CommTxPoolNormalCommon-r14 SL-CommTxPoolListV2X-r14 OPTIONAL, -- Need OR

p2x-CommTxPoolNormalCommon-r14 SL-CommTxPoolListV2X-r14 OPTIONAL, -- Need OR

v2x-CommTxPoolExceptional-r14 SL-CommResourcePoolV2X-r14 OPTIONAL, -- Need OR

v2x-SyncConfig-r14  SL-SyncConfigListV2X-r14 OPTIONAL, -- Need OR

v2x-InterFreqInfoList-r14  SL-InterFreqInfoListV2X-r14 OPTIONAL, -- Need OR

v2x-ResourceSelectionConfig-r14 SL-CommTxPoolSensingConfig-r14 OPTIONAL, -- Need OR

zoneConfig-r14 SL-ZoneConfig-r14 OPTIONAL, -- Need OR

typeTxSync-r14 SL-TypeTxSync-r14 OPTIONAL, -- Need OR

thresSL-TxPrioritization-r14 SL-Priority-r13 OPTIONAL, -- Need OR

anchorCarrierFreqList-r14 SL-AnchorCarrierFreqList-V2X-r14 OPTIONAL, -- Need OR

offsetDFN-r14 INTEGER (0..1000) OPTIONAL, -- Need OR

cbr-CommonTxConfigList-r14 SL-CBR-CommonTxConfigList-r14 OPTIONAL -- Need OR

}

-- ASN1STOP

| *SystemInformationBlockType21* field descriptions |
| --- |
| ***anchorCarrierFreqList***  Indicates EUTRA carrier frequencies which may include inter-carrier resource configuration for V2X sidelink communication. |
| ***anchorCarrierFreqListNR***  Indicates NR carrier frequencies which may include inter-carrier resource configuration for V2X sidelink communication. |
| ***cbr-CommonTxConfigList***  Indicates the common list of CBR ranges and the list of PSSCH transmissions parameter configurations available to configure congestion control to the UE for V2X sidelink communication. |
| ***offsetDFN***  Indicates the timing offset for the UE to determine DFN timing when GNSS is used for timing reference for the PCell. Value 0 corresponds to 0 milliseconds, value 1 corresponds to 0.001 milliseconds, value 2 corresponds to 0.002 milliseconds, and so on. |
| ***p2x-CommTxPoolNormalCommon***  Indicates the resources by which the UE is allowed to transmit P2X related V2X sidelink communication. *zoneID* is not configured in the pools in this field. |
| ***thresSL-TxPrioritization***  Indicates the threshold used to determine whether SL V2X transmission is prioritized over uplink transmission if they overlap in time (see TS 36.321 [6]). This value shall overwrite *thresSL-TxPrioritization* configured in *SL-V2X-Preconfiguration* if any. |
| ***typeTxSync***  Indicates the prioritized synchronization type (i.e. eNB or GNSS) for performing V2X sidelink communication on the carrier frequency on which this field is broadcast. |
| ***v2x-CommRxPool***  Indicates the resources by which the UE is allowed to receive V2X sidelink communication while in RRC\_IDLE and in RRC\_CONNECTED. |
| ***v2x-CommTxPoolExceptional***  Indicates the resources by which the UE is allowed to transmit V2X sidelink communication in exceptional conditions, as specified in 5.10.13. |
| ***v2x-CommTxPoolNormalCommon***  Indicates the resources by which the UE is allowed to transmit non-P2X related V2X sidelink communication when in RRC\_IDLE or when in RRC\_CONNECTED while transmitting V2X sidelink communication via a frequency other than the primary. E-UTRAN configures one resource pool per zone. |
| ***v2x-InterFreqInfoList***  Indicates synchronization and resource allocation configurations of neighboring frequencies for V2X sidelink communication. |
| ***v2x-ResourceSelectionConfig***  Indicates V2X sidelink communication configurations used for UE autonomous resource selection. |
| ***v2x-SyncConfig***  Indicates the configuration by which the UE is allowed to receive and transmit synchronisation information for V2X sidelink communication. E-UTRAN configures *v2x-*S*yncConfig* including *txParameters* when configuring UEs to transmit synchronisation information. |
| ***zoneConfig***  Indicates zone configurations used for V2X sidelink communication in 5.10.13.2. |

#### – *SystemInformationBlockType24*

The IE *SystemInformationBlockType24* contains information relevant for inter-RAT cell re-selection (i.e. information about NR frequencies and NR neighbouring cells relevant for cell re-selection), which can also be used for NR idle/inactive measurements. The IE includes cell re-selection parameters common for a frequency.

*SystemInformationBlockType24* information element

-- ASN1START

SystemInformationBlockType24-r15 ::= SEQUENCE {

carrierFreqListNR-r15 CarrierFreqListNR-r15 OPTIONAL, -- Need OR

t-ReselectionNR-r15 T-Reselection,

t-ReselectionNR-SF-r15 SpeedStateScaleFactors OPTIONAL, -- Need OR

lateNonCriticalExtension OCTET STRING OPTIONAL,

...,

[[ carrierFreqListNR-v1610 CarrierFreqListNR-v1610 OPTIONAL -- Need OR

]],

[[ carrierFreqListNR-v1700 CarrierFreqListNR-v1700 OPTIONAL -- Need OR

]]

}

CarrierFreqListNR-r15 ::= SEQUENCE (SIZE (1..maxFreq)) OF CarrierFreqNR-r15

CarrierFreqListNR-v1610 ::= SEQUENCE (SIZE (1..maxFreq)) OF CarrierFreqNR-v1610

CarrierFreqListNR-v1700 ::= SEQUENCE (SIZE (1..maxFreq)) OF CarrierFreqNR-v1700

CarrierFreqNR-r15 ::= SEQUENCE {

carrierFreq-r15 ARFCN-ValueNR-r15,

multiBandInfoList-r15 MultiFrequencyBandListNR-r15 OPTIONAL, -- Need OR

multiBandInfoListSUL-r15 MultiFrequencyBandListNR-r15 OPTIONAL, -- Need OR

measTimingConfig-r15 MTC-SSB-NR-r15 OPTIONAL, -- Need OR

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

ss-RSSI-Measurement-r15 SS-RSSI-Measurement-r15 OPTIONAL, -- Cond RSRQ2

cellReselectionPriority-r15 CellReselectionPriority OPTIONAL, -- Need OP

cellReselectionSubPriority-r15 CellReselectionSubPriority-r13 OPTIONAL, -- Need OR

threshX-High-r15 ReselectionThreshold,

threshX-Low-r15 ReselectionThreshold,

threshX-Q-r15 SEQUENCE {

threshX-HighQ-r15 ReselectionThresholdQ-r9,

threshX-LowQ-r15 ReselectionThresholdQ-r9

} OPTIONAL, -- Cond RSRQ

q-RxLevMin-r15 INTEGER (-70..-22),

q-RxLevMinSUL-r15 INTEGER (-70..-22) OPTIONAL, -- Need OR

p-MaxNR-r15 P-MaxNR-r15,

ns-PmaxListNR-r15 NS-PmaxListNR-r15 OPTIONAL, -- Need OR

q-QualMin-r15 INTEGER (-43..-12) OPTIONAL, -- Need OP

deriveSSB-IndexFromCell-r15 BOOLEAN,

maxRS-IndexCellQual-r15 MaxRS-IndexCellQualNR-r15 OPTIONAL, -- Need OR

threshRS-Index-r15 ThresholdListNR-r15 OPTIONAL, -- Need OR

...,

[[ multiBandNsPmaxListNR-v1550 MultiBandNsPmaxListNR-1-v1550 OPTIONAL, -- Need OR

multiBandNsPmaxListNR-SUL-v1550 MultiBandNsPmaxListNR-v1550 OPTIONAL, -- Need OR

ssb-ToMeasure-r15 SSB-ToMeasure-r15 OPTIONAL -- Need OR

]]

}

CarrierFreqNR-v1610 ::= SEQUENCE {

smtc2-LP-r16 MTC-SSB2-LP-NR-r16 OPTIONAL, -- Need OR

ssb-PositionQCL-CommonNR-r16 SSB-PositionQCL-RelationNR-r16 OPTIONAL, -- Cond SharedSpectrum2

allowedCellListNR-r16 AllowedCellListNR-r16 OPTIONAL, -- Cond SharedSpectrum

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

}

CarrierFreqNR-v1700 ::= SEQUENCE {

nr-FreqNeighHSDN-CellList-r17 NR-FreqNeighHSDN-CellList-r17 OPTIONAL -- Need OR

}

MultiBandNsPmaxListNR-1-v1550 ::= SEQUENCE (SIZE (1.. maxMultiBandsNR-1-r15)) OF NS-PmaxListNR-r15

MultiBandNsPmaxListNR-v1550 ::= SEQUENCE (SIZE (1.. maxMultiBandsNR-r15)) OF NS-PmaxListNR-r15

AllowedCellListNR-r16 ::= SEQUENCE (SIZE (1..maxCellAllowedNR-r16)) OF PhysCellIdNR-r15

NR-FreqNeighHSDN-CellList-r17 ::= SEQUENCE (SIZE (1..maxCellNR-r17)) OF PhysCellIdRangeNR-r16

-- ASN1STOP

| *SystemInformationBlockType24* field descriptions |
| --- |
| ***allowedCellListNR***  List of allow-listed neighbouring NR cells. |
| ***carrierFreqListNR***  List of carrier frequencies of NR carriers. These frequencies correspond to GSCN values as specified in TS 38.101 [85]. If the *carrierFreqListNR-v1610* is present, it contains the same number of entries, listed in the same order as in the *carrierFreqListNR* (without suffix). |
| ***cellReselectionPriority***  The field concerns the absolute priority of the concerned carrier frequency as used by the cell reselection procedure. Corresponds with parameter "priority" in TS 36.304 [4]. |
| ***deriveSSB-IndexFromCell***  The field indicates whether the UE may use, to derive the SSB index of a cell on the indicated SSB frequency and subcarrier spacing, the timing of any detected cell with the same SSB frequency and subcarrier spacing. If this field is set to TRUE, the UE assumes SFN and frame boundary alignment across cells on the same NR carrier frequency as specified in TS 36.133 [16]. |
| ***highSpeedCarrierNR***  If the field is present, the UE shall apply the enhanced inter-RAT NR measurement requirements to support high speed up to 500 km/h as specified in TS 36.133 [16] to the NR carrier. |
| ***maxRS-IndexCellQual***  Number of SS blocks to average for cell measurement derivation. Corresponds to the parameter *nrofSS-BlocksToAverage* in TS 38.304 [92]. |
| ***measTimingConfig***  Used to configure measurement timing configurations, i.e., timing occasions at which the UE measures SSBs. If the field is absent, the UE assumes that SSB periodicity is 5ms in this frequency. |
| ***multiBandInfoList***  Indicates the list of frequency bands for which the NR cell reselection parameters apply. The UE shall select the first listed band which it supports in the *multiBandInfoList* field to represent the NR neighbour carrier frequency. The network always includes this field. |
| ***multiBandInfoListSUL***  Indicates the list of frequency bands for which the NR cell reselection parameters apply. The UE shall select the first listed band which it supports in the *multiBandInfoListSUL* field to represent the NR neighbour carrier frequency. |
| ***multiBandNsPmaxListNR***  Indicates the *NS-PmaxListNR* configuration for the NR frequency band(s) listed in *multiBandInfoList*. The first entry corresponds to the second listed band in *multiBandInfoList*, and second entry corresponds to the third listed band in *multiBandInfoList*, and so on. |
| ***multiBandNsPmaxListNR-SUL***  Indicates the *NS-PmaxListNR* configuration for the NR SUL frequency band(s) listed in *multiBandInfoListSUL*. The first entry corresponds to the first listed band in *multiBandInfoListSUL*, and second entry corresponds to the second listed band in *multiBandInfoListSUL*, and so on. |
| ***nr-FreqNeighHSDN-CellList***  List of neighbouring NR HSDN cells as specified in TS 38.304 [92]. |
| ***ns-PmaxListNR***  Indicates a list of *additionalPmax* and *additionalSpectrumEmission*, corresponds to the first listed band in the *multiBandInfoList*. |
| ***p-MaxNR***  Indicates the maximum power for NR (see TS 38.104 [91]) the UE can use in NR SCG. |
| ***q-QualMin***  Parameter "Qqualmin" in TS 36.304 [4], applicable for NR neighbour cells. If the field is not present, the UE applies the (default) value of negative infinity for Qqualmin. The actual value Qqualmin = field value [dB]. |
| ***q-RxLevMin***  Parameter "Qrxlevmin" in TS 38.304 [92], applicable for NR neighbour cells. The actual value Qrxlevmin = field value \* 2 [dBm]. |
| ***q-RxLevMinSUL***  Parameter "Qrxlevmin" in TS 38.304 [92], applicable for NR neighbouring cells. The actual value Qrxlevmin = field value \* 2 [dBm]. |
| ***smtc2-LP***  Measurement timing configuration for inter-RAT neighbour cells in NR with a Long Periodicity (LP) indicated by periodicity in *smtc2-LP*. The timing offset and duration are equal to the offset and duration indicated in *measTimingConfig* in *CarrierFreqNR*. The periodicity in *smtc2-LP* can only be set to a value strictly larger than the periodicity in *measTimingConfig* in *CarrierFreqNR* (e.g. if *measTimingConfig* indicates sf20 the Long Periodicity can only be set to sf40, sf80 or sf160, if *measTimingConfig* indicates sf160, *smtc2-LP* cannot be configured). The *pci-List*, if present, includes the physical cell identities of the inter-RAT neighbour cells with Long Periodicity. If *smtc2-LP* is absent, the UE assumes that there are no inter-RAT neighbour cells with a Long Periodicity. |
| ***ssb-PositionQCL-CommonNR***  Indicates the QCL relationship between SS/PBCH blocks for NR neighbor cells on the indicated frequency as specified in TS 38.213 [88], clause 4.1. |
| ***ssb-ToMeasure***  The set of SS blocks to be measured within the SMTC measurement duration (see TS 38.215 [89]). When the field is absent the UE measures on all SS-blocks. |
| ***ss-RSSI-Measurements***  Indicates the SSB-based RSSI measurement configuration. If the field is absent, the UE behaviour is defined in TS 38.215 [89], clause 5.1.3. |
| ***threshRS-Index***  List of thresholds for consolidation of L1 measurements per RS index. Corresponds to the parameter *absThreshSS-BlocksConsolidation* in TS 38.304 [92]. |
| ***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-ReselectionNR***  Parameter "TreselectionNR" in TS 36.304 [4]. |
| ***t-ReselectionNR-SF***  Parameter "Speed dependent ScalingFactor for TreselectionNR" in TS 36.304 [4]. If the field is not present, the UE behaviour is specified in TS 36.304 [4]. |

| Conditional presence | Explanation |
| --- | --- |
| *RSRQ* | The field is mandatory present if the *threshServingLowQ* is present in *systemInformationBlockType3*; otherwise it is not present. |
| *RSRQ2* | The field is optional Need OP if the *threshServingLowQ* is present in *systemInformationBlockType3*; otherwise it is not present. |
| *SharedSpectrum* | The field is optional Need OP if NR operates with shared spectrum channel access; otherwise, it is not present. |
| *SharedSpectrum2* | The field is mandatory present if NR operates with shared spectrum channel access; otherwise, it is not present. |

#### – *SystemInformationBlockType25*

The IE *SystemInformationBlockType25* contains the UAC parameters.

*SystemInformationBlockType25* information element

-- ASN1START

SystemInformationBlockType25-r15 ::= SEQUENCE {

uac-BarringForCommon-r15 UAC-BarringPerCatList-r15 OPTIONAL, -- Need OP

uac-BarringPerPLMN-List-r15 UAC-BarringPerPLMN-List-r15 OPTIONAL, -- Need OP

uac-BarringInfoSetList-r15 UAC-BarringInfoSetList-r15,

uac-AC1-SelectAssistInfo-r15 CHOICE {

plmnCommon-r15 UAC-AC1-SelectAssistInfo-r15,

individualPLMNList-r15 SEQUENCE (SIZE (2..maxPLMN-r11)) OF UAC-AC1-SelectAssistInfo-r15

} OPTIONAL, -- Need OR

lateNonCriticalExtension OCTET STRING OPTIONAL,

...,

[[ ab-PerRSRP-r16 ENUMERATED {thresh0, thresh1, thresh2, thresh3} OPTIONAL -- Need OR

]],

[[

uac-AC1-SelectAssistInfo-r16 SEQUENCE (SIZE (2..maxPLMN-r11)) OF UAC-AC1-SelectAssistInfo-r16 OPTIONAL -- Need OR

]],

[[

uac-BarringInfoSetList-v1700 UAC-BarringInfoSetList-v1700 OPTIONAL -- Cond MINT

]]

}

UAC-BarringPerPLMN-List-r15::= SEQUENCE (SIZE (1.. maxPLMN-r11)) OF UAC-BarringPerPLMN-r15

UAC-BarringPerPLMN-r15 ::= SEQUENCE {

plmn-IdentityIndex-r15 INTEGER (1.. maxPLMN-r11),

uac-AC-BarringListType-r15 CHOICE{

uac-ImplicitAC-BarringList-r15 SEQUENCE (SIZE(maxAccessCat-1-r15)) OF UAC-BarringInfoSetIndex-r15,

uac-ExplicitAC-BarringList-r15 UAC-BarringPerCatList-r15

} OPTIONAL -- Need OR

}

UAC-BarringPerCatList-r15 ::= SEQUENCE (SIZE (1..maxAccessCat-1-r15)) OF UAC-BarringPerCat-r15

UAC-BarringPerCat-r15 ::= SEQUENCE {

accessCategory-r15 INTEGER (1..maxAccessCat-1-r15),

uac-barringInfoSetIndex-r15 UAC-BarringInfoSetIndex-r15

}

UAC-BarringInfoSetIndex-r15 ::= INTEGER (1..maxBarringInfoSet-r15)

UAC-BarringInfoSetList-r15 ::= SEQUENCE (SIZE (1..maxBarringInfoSet-r15)) OF UAC-BarringInfoSet-r15

UAC-BarringInfoSetList-v1700 ::= SEQUENCE (SIZE(1..maxBarringInfoSet-r15)) OF UAC-BarringInfoSet-v1700

UAC-BarringInfoSet-r15 ::= SEQUENCE {

uac-BarringFactor-r15 ENUMERATED {

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

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

uac-BarringTime-r15 ENUMERATED {s4, s8, s16, s32, s64, s128, s256, s512},

uac-BarringForAccessIdentity-r15 BIT STRING (SIZE(7))

}

UAC-BarringInfoSet-v1700 ::= SEQUENCE {

uac-BarringFactorForAI3-r17 ENUMERATED {p00, p05, p10, p15, p20, p25, p30, p40,

p50, p60, p70, p75, p80, p85, p90, p95} OPTIONAL -- Need OP

}

UAC-AC1-SelectAssistInfo-r15::= ENUMERATED {a, b, c}

UAC-AC1-SelectAssistInfo-r16::= ENUMERATED {a, b, c, notConfigured}

-- ASN1STOP

| *SystemInformationBlockType25* field descriptions |
| --- |
| ***accessCategory***  The Access Category according to TS 22.261 [96]. |
| ***ab-PerRSRP***  Access barring per RSRP. Value *thresh0* means access to the cell is barred when UE is in enhanced coverage as specified in TS 36.304 [4] and does not apply to UEs satisfying S criteria for normal coverage. Value *thresh1* is compared to the first entry configured in *rsrp-ThresholdsPrachInfoList*, value thresh2 is compared to the second entry configured in *rsrp-ThresholdsPrachInfoList* and so on. E-UTRA/5GC includes this field only in the BR version of *SystemInformationBlockType25.* |
| ***uac-AC-BarringListType***  Access control parameters for each access category valid only for a specific PLMN. UE behaviour upon absence of this field is specified in clause 5.3.16.2. |
| ***uac-AC1-SelectAssistInfo***  Information used to determine whether Access Category 1 applies to the UE, as defined in TS 22.261 [96]. If *plmnCommon* is chosen, the *UAC-AC1-SelectAssistInfo* is applicable to all the PLMNs in *cellAccessRelatedInfoList-5GC*. If *individualPLMNList* is chosen, the 1st entry in the list corresponds to the first PLMN in *cellAccessRelatedInfoList-5GC*, the 2nd entry in the list corresponds to the second PLMN in *cellAccessRelatedInfoList-5GC* and so on. If *uac-AC1-SelectAssistInfo-r16* is present, the UE shall ignore the *uac-AC1-SelectAssistInfo-r15*. Value *notConfigured* indicates that Access Category1 is not configured for the corresponding PLMN. The corresponding *UAC-AC1-SelectAssistInfo* for the selected PLMN is forwarded to upper layers, if present and set to *a*, *b* or *c*. |
| ***uac-BarringFactor***  Represents the probability that access attempt would be allowed during access barring check. |
| ***uac-BarringFactorForAI3***  Barring factor applicable for Access Identity 3. Represents the probability that access attempt would be allowed during access barring check. If absent, the UE considers the access attempt as allowed. |
| ***uac-BarringForAccessIdentity***  Indicates whether access attempt is allowed for each Access Identity. The leftmost bit, bit 0 in the bit string corresponds to Access Identity 1, bit 1 in the bit string corresponds to Access Identity 2, bit 2 in the bit string corresponds to Access Identity 11, bit 3 in the bit string corresponds to Access Identity 12 and so on. Value 0 means that access attempt is allowed for the corresponding access identity. |
| ***uac-BarringForCommon***  Common access control parameters for each access category. Common values are used for all PLMNs, unless overwritten by the PLMN specific configuration provided in *uac-BarringPerPLMN-List.* The parameters are specified by providing an index to the set of configurations (*uac-BarringInfoSetList*). UE behaviour upon absence of this field is specified in clause 5.3.16.2. |
| ***uac-barringInfoSetIndex***  Index of the entry in field *uac-BarringInfoSetList*. Value 1 corresponds to the first entry in *uac-BarringInfoSetList,* value 2 corresponds to the second entry in this list and so on. An index value referring to an entry not included in *uac-BarringInfoSetList* indicates no barring. |
| ***uac-BarringInfoSetList***  List of access control parameter sets. Each access category can be configured with access parameters corresponding to a particular set by *uac-barringInfoSetIndex*. Association of an access category with an index that has no corresponding entry in the *uac-BarringInfoSetList* is valid configuration and indicates no barring. |
| ***uac-BarringPerPLMN-List***  Access control parameters for each access category valid only for a specific PLMN. |
| ***uac-BarringTime***  The average time in seconds before a new access attempt is to be performed after an access attempt was barred at access barring check for the same access category, see 5.3.16.5. |

| Conditional presence | Explanation |
| --- | --- |
| *MINT* | The field is optionally present, Need OR, in a cell that provides a configuration for disaster roaming, otherwise it is absent. |

#### – *SystemInformationBlockType26*

The IE *SystemInformationBlockType26* contains V2X sidelink communication configurations which can be used jointly with those included in *SystemInformationBlockType21*.

*SystemInformationBlockType26* information element

-- ASN1START

SystemInformationBlockType26-r15 ::= SEQUENCE {

v2x-InterFreqInfoList-r15 SL-InterFreqInfoListV2X-r14 OPTIONAL, -- Need OR

cbr-pssch-TxConfigList-r15 SL-CBR-PPPP-TxConfigList-r15 OPTIONAL, -- Need OR

v2x-PacketDuplicationConfig-r15 SL-V2X-PacketDuplicationConfig-r15 OPTIONAL, -- Need OR

syncFreqList-r15 SL-V2X-SyncFreqList-r15 OPTIONAL, -- Need OR

slss-TxMultiFreq-r15 ENUMERATED{true} OPTIONAL, -- Need OR

v2x-FreqSelectionConfigList-r15 SL-V2X-FreqSelectionConfigList-r15 OPTIONAL, -- Need OR

threshS-RSSI-CBR-r15 INTEGER (0..45) OPTIONAL, -- Need OR

...,

lateNonCriticalExtension OCTET STRING OPTIONAL

}

-- ASN1STOP

| *SystemInformationBlockType26* field descriptions |
| --- |
| ***cbr-pssch-TxConfigList***  Indicates the mapping between PPPPs, CBR ranges by using indexes of the entry in *cbr-RangeCommonConfigList* included in SIB21, and PSSCH transmission parameters and CR limit by using indexes of the entry in *sl-CBR-PSSCH-TxConfigList* included in SIB21. The configurations in this field apply to all the resource pools on all the carrier frequencies included in SIB26 for V2X sidelink communication transmission. The *mcs-PSSCH-RangeList-r15* included in this field also applies to all the resource pools on all the carrier frequencies included in SIB21 for V2X sidelink communication transmission. |
| ***slss-TxMultiFreq***  Value TRUE indicates the UE transmits SLSS on multiple carrier frequencies for V2X sidelink communication. If this field is absent, the UE transmits SLSS only on the synchronisation carrier frequency. |
| ***syncFreqList***  Indicates a list of candidate carrier frequencies that can be used for the synchronisation of V2X sidelink communication. |
| ***threshS-RSSI-CBR***  Indicates the S-RSSI threshold for determining the contribution of a sub-channel to the CBR measurement, as specified in TS 36.214 [48]. Value 0 corresponds to -112 dBm, value 1 to -110 dBm, value n to (-112 + n\*2) dBm, and so on. If included, the *threshS-RSSI-CBR* in *SL-CommResourcePoolV2X* in SIB26 is absent. |
| ***v2x-FreqSelectionConfigList***  Indicates the configuration information for the carrier selection for V2X sidelink communication transmission on the carrier frequency where the field is broadcast. |
| ***v2x-PacketDuplicationConfig***  Indicates the configuration information for sidelink packet duplication for V2X sidelink communication. |
| ***v2x-InterFreqInfoList***  If this field includes a carrier frequency which is included in SIB21 and some configuration(s) for that carrier are already included in SIB21, the corresponding configuration(s) for that carrier frequency are not included in this field. |

#### – *SystemInformationBlockType26a*

The IE *SystemInformationBlockType26a* contains NR bands list which can be used for EN-DC operation with the serving cell.

*SystemInformationBlockType26a* information element

-- ASN1START

SystemInformationBlockType26a-r16 ::= SEQUENCE {

plmn-InfoList-r16 PLMN-InfoList-r16,

bandListENDC-r16 BandListENDC-r16,

lateNonCriticalExtension OCTET STRING OPTIONAL,

...

}

BandListENDC-r16 ::= SEQUENCE (SIZE (1.. maxBandsENDC-r16)) OF FreqBandIndicatorNR-r15

PLMN-InfoList-r16 ::= SEQUENCE (SIZE (0..maxPLMN-r11)) OF PLMN-Info-r16

PLMN-Info-r16 ::= SEQUENCE {

nr-BandList-r16 BIT STRING (SIZE(maxBandsENDC-r16)) OPTIONAL -- Need OR

}

-- ASN1STOP

| *SystemInformationBlockType26a* field descriptions |
| --- |
| ***bandListENDC***  A list of NR bands which can be configured as SCG in EN-DC operation with serving cell for the forwarding of *upperLayerIndication* to upper layers. |
| ***plmn-InfoList***  This field includes the same number of entries, and listed in the same order as PLMNs across the *plmn-IdentityList* fields *plmn-IdentityList* and *plmn-IdentityList-r14* 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 in SIB1. If the size of the field is set to 0, all bands in *bandListENDC* apply for all PLMNs listed in SIB1. |
| ***nr-BandList***  This field indicates a list of bands and is encoded as a bitmap, where the bit N is set to "1" if the current serving cell supports EN-DC operation with the *N*-th NR band in *bandListENDC*. The bits which have no corresponding bands in *bandListENDC* shall be set to 0; bit 1 of the bitmap is the leading bit of the bit string. |

#### – *SystemInformationBlockType27*

The IE *SystemInformationBlockType27* contains information relevant only for inter-RAT cell selection i.e. assistance information about NB-IoT frequencies for cell selection.

*SystemInformationBlockType27* information element

-- ASN1START

SystemInformationBlockType27-r16 ::= SEQUENCE {

carrierFreqListNBIOT-r16 CarrierFreqListNBIOT-r16 OPTIONAL, -- Need OR

lateNonCriticalExtension OCTET STRING OPTIONAL,

...

}

CarrierFreqListNBIOT-r16 ::= SEQUENCE (SIZE (1.. maxFreqNBIOT-r16)) OF CarrierFreqNBIOT-r16

CarrierFreqNBIOT-r16 ::= SEQUENCE {

carrierFreq-r16 ARFCN-ValueEUTRA-r9,

carrierFreqOffset-r16 ENUMERATED {v-10, v-9, v-8dot5, v-8, v-7, v-6, v-5, v-4dot5,

v-4,v-3, v-2, v-1, v-0dot5, v0, v1, v2, v3, v3dot5,

v4, v5, v6, v7, v7dot5, v8, v9}

}

-- ASN1STOP

| *SystemInformationBlockType27* field descriptions |
| --- |
| ***carrierFreqListNBIOT***  Provides a list of neighbouring NB-IoT carrier frequencies, which may be searched for neighbouring NB-IoT cells. |
| ***carrierFreq***  Provides the ARFCN applicable for the NB-IoT carrier frequency as defined in TS 36.101 [42], Table 5.7.3-1. |
| ***carrierFreqOffset***  Offset of the NB-IoT channel number to EARFCN as defined in TS 36.101 [42], clause 5.7.3F. Value *v-10* means -10, *v-9* means -9, and so on. The values *v-8dot5*, *v-4dot5*, *v3dot5* and *v7dot5* are only applicable for a carrier in a TDD band. |

#### – *SystemInformationBlockType28*

The IE *SystemInformationBlockType28* contains NR sidelink communication configuration.

*SystemInformationBlockType28* information element

-- ASN1START

SystemInformationBlockType28-r16 ::= SEQUENCE {

segmentNumber-r16 INTEGER (0..63),

segmentType-r16 ENUMERATED {notLastSegment,lastSegment},

segmentContainer-r16 OCTET STRING,

lateNonCriticalExtension OCTET STRING OPTIONAL,

...

}

-- ASN1STOP

| *SystemInformationBlockType28* field descriptions |
| --- |
| ***segmentContainer***  Container for the configuration for NR sidelink communication, this field includes a segment of *SIB12-IEs* as specified in TS 38.331 [82]. The size of the included segment in this container should be small enough that the SIB message size is less than or equal to the maximum size of a LTE SI i.e. 2216 bits. |
| ***segmentNumber***  This field identifies the sequence number of a segment of *SIB12-IEs* IE as specified in TS 38.331 [82]. A segment number of zero corresponds to the first segment, a segment number of one corresponds to the second segment, and so on. |
| ***segmentType***  This field indicates whether the included segment is the last segment or not. |

#### – *SystemInformationBlockType29*

The IE *SystemInformationBlockType29* contains common resource reservation, e.g. for coexistence with NR.

*SystemInformationBlockType29* information element

-- ASN1START

SystemInformationBlockType29-r16 ::= SEQUENCE {

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

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

lateNonCriticalExtension OCTET STRING OPTIONAL,

...

}

-- ASN1STOP

#### – *SystemInformationBlockType30*

The IE *SystemInformationBlockType30* contains configurations of disaster roaming information.

*SystemInformationBlockType30* information element

-- ASN1START

SystemInformationBlockType30-r17 ::= SEQUENCE {

commonPLMNsWithDisasterCondition-r17 SEQUENCE (SIZE (1..maxPLMN-r11)) OF PLMN-Identity OPTIONAL, -- Need OR

applicableDisasterInfoList-r17 SEQUENCE (SIZE (1..maxPLMN-r11)) OF ApplicableDisasterInfo-r17 OPTIONAL, -- Need OR

lateNonCriticalExtension OCTET STRING OPTIONAL,

...

}

ApplicableDisasterInfo-r17 ::= CHOICE {

noDisasterRoaming-r17 NULL,

oneBitApproach-r17 NULL, -- The semantics for this approach is pending CT1 progress

commonPLMNs-r17 NULL,

dedicatedPLMNs-r17 SEQUENCE (SIZE (1..maxPLMN-r11)) OF PLMN-Identity

}

-- ASN1STOP

| ***SystemInformationBlockType30* field descriptions** |
| --- |
| ***commonPLMNsWithDisasterCondition***  A list of PLMN(s) with disaster condition which can be commonly applicable to the PLMNs sharing the cell. |
| ***applicableDisasterInfoList***  A list indicating the applicable disaster information for the networks indicated by *plmn-IdentityList-r15* in *CellAccessRelatedInfo-5GC-r15*. The first entry in this list indicates the disaster information applicable for the network(s) in the first entry of *plmn-IdentityList*, the second entry in this list indicates the disaster information applicable for the network(s) in the second entry on *plmn-IdentityList*, and so on. Each entry in this list can either be having the value *noDisasterRoaming*, *oneBitApproach*, *commonPLMNs*, or *dedicatedPLMNs*. If an entry in this list takes the value *noDisasterRoaming*, disaster roaming is not allowed for this network(s). If an entry in this list takes the value *oneBitApproach*, [TBD what happens]. If an entry in this list takes the value *commonPLMNs*, the PLMN(s) with disaster conditions indicated in the field *commonPLMNsWithDisasterCondition* apply for this entry. If an entry in this list contains the value *dedicatedPLMNs*, the listed PLMN(s) are the PLMN(s) with disaster conditions that apply to the network(s) corresponding to this entry. |

#### *– SystemInformationBlockType31*

The IE *SystemInformationBlockType31* contains satellite assistance information for the serving cell. *SystemInformationBlockType31* is only signalled in a NTN cell.

*SystemInformationBlockType31* information element

-- ASN1START

SystemInformationBlockType31-r17 ::= SEQUENCE {

servingSatelliteInfo-r17 ServingSatelliteInfo-r17,

lateNonCriticalExtension OCTET STRING OPTIONAL,

...

}

ServingSatelliteInfo-r17 ::= SEQUENCE {

ephemerisInfo-r17 CHOICE {

stateVectors EphemerisStateVectors-r17,

orbitalParameters EphemerisOrbitalParameters-r17

},

nta-CommonParameters-17 SEQUENCE {

nta-Common-r17 INTEGER (0..8316827) OPTIONAL, -- Need OP

nta-CommonDrift-r17 INTEGER (-261935..261935) OPTIONAL, -- Need OP

nta-CommonDriftVariation-r17 INTEGER (0..29479) OPTIONAL -- Need OP

},

ul-SyncValidityDuration-r17 ENUMERATED {s5, s10, s15, s20, s25, s30, s35, s40,

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

epochTime-r17 SEQUENCE {

startSFN-r17 INTEGER (0..1023),

startSubFrame-r17 INTEGER (0..9)

} OPTIONAL, -- Need OP

k-Offset-r17 INTEGER (0..1023),

k-Mac-r17 INTEGER (1..512) OPTIONAL, -- Need OP

...

}

-- ASN1STOP

| *SystemInformationBlockType31* field descriptions |
| --- |
| ***epochTime***  Epoch time of the satellite ephemeris data and common TA parameters, see TS 36.213 [23]. The reference point for epoch time of the serving satellite ephemeris and Common TA parameters is the uplink time synchronization reference point.  *epochTime* is the starting time of a DL subframe indicated by *startSFN* and *startSubframe*.  If the field is absent, the UE uses the starting time of the DL subframe corresponding to the end of the SI window during which the SI message carrying SIB31 is transmitted.  E-UTRAN always includes *epochTime* when *SystemInformationBlockType31* is provided through dedicated signalling. |
| ***k-Mac***  Scheduling offset used when downlink and uplink frame timing are not aligned at the eNB, see TS 36.213 [23]. Unit in ms.  If the field if absent, the UE uses the (default) value of 0. |
| ***k-Offset***  Scheduling offset used in the timing relationships in NTN, see TS 36.213 [23]. Unit in ms. |
| ***nta-Common***  Network-controlled common TA, see TS 36.213 [23]. Unit of μs.  Step of 32.55208 ×10-3 μs. Actual value = field value \* 32.55208 ×10-3.  If the field is absent, the UE uses the (default) value of 0. |
| ***nta-CommonDrift***  Drift rate of the common TA, see TS 36.213 [23]. Unit of μs/s.  Step of 0.2 ×10-3 μs/s. Actual value = field value \* 0.2 ×10-3.  If the field is absent, the UE uses the (default) value of 0. |
| ***nta-CommonDriftVariation***  Drift rate variation of the common TA, see TS 36.213 [23]. Unit of μs/s2.  Step of 0.2 ×10-4 μs/s2. Actual value = field value \* 0.2 ×10-4.  If the field is absent, the UE uses the (default) value of 0. |
| ***orbitalParameters***  Instantaneous values of the satellite orbital parameters. The signalled values are only valid for the duration as defined by *ul-SyncValidationDuration* and *epochTime*. |
| ***stateVectors***  Instantaneous values of the satellite state vectors. The signalled values are only valid for the duration as defined by *ul-SyncValidationDuration* and *epochTime*. |
| ***ul-SyncValidationDuration***  Validity duration of the satellite ephemeris data and common TA parameters, i.e. maximum time during which the UE can apply the satellite ephemeris without acquiring new satellite ephemeris, see TS 36.213 [23]. Unit in second.  Value *s5* corresponds to 5 seconds, value *s10* corresponds to 10 seconds and so on. |

#### – *SystemInformationBlockType32*

The IE *SystemInformationBlockType32* contains satellite assistance information for prediction of discontinuous coverage. *SystemInformationBlockType32* is only signalled in a NTN cell

*SystemInformationBlockType32* information element

-- ASN1START

SystemInformationBlockType32-r17 ::= SEQUENCE {

satelliteInfoList-r17 SatelliteInfoList-r17 OPTIONAL, -- Need OR

lateNonCriticalExtension OCTET STRING OPTIONAL,

...

}

SatelliteInfoList-r17 ::= SEQUENCE (SIZE (1..maxSat-r17)) OF SatelliteInfo-r17

SatelliteInfo-r17 ::= SEQUENCE {

satelliteId-r17 INTEGER (0..255),

serviceInfo-r17 SEQUENCE {

tle-EphemerisParameters-r17 TLE-EphemerisParameters-r17 OPTIONAL, -- Need OR

t-ServiceStart-r17 TimeOffsetUTC-r17 OPTIONAL -- Need OR

},

footprintInfo-r17 SEQUENCE {

referencePoint-r17 SEQUENCE {

longitude-r17 INTEGER (-131072..131071),

latitude-r17 INTEGER (-131072..131071)

} OPTIONAL, -- Need OR

elevationAngles-r17 SEQUENCE {

elevationAngleRight-r17 INTEGER (-7..7),

elevationAngleLeft-r17 INTEGER (-7..7) OPTIONAL -- Need OP

} OPTIONAL, -- Need OR

radius-r17 INTEGER (1..256) OPTIONAL -- Need OR

}

}

-- ASN1STOP

| *SystemInformationBlockType32* field descriptions |
| --- |
| ***elevationAngleLeft, elevationAngleRight***  Leftmost and rightmost (with reference to the satellite direction) elevation angle. Unit in degree.  Step of 10 degree. Actual value = field value \* 10.  If the field *elevationAngleLeft* is absent, the value of field *elevationAngleRight* applies. |
| ***footprintInfo***  Satellite footprint.  E-UTRAN may configure *elevationAngles* and/or *radius* for earth moving satellite.  E-UTRAN may configure *referencePoint* and *radius* for quasi earth fixed satellite. |
| ***latitude***  Latitude of the reference point. Unit in degree.  Step of 360 / 262144 degree. Actual value = field value \* (360 / 262144). |
| ***longitude***  Longitude of the reference point. Unit in degree.  Step of 360 / 262144 degree. Actual value = field value \* (360 / 262144). |
| ***radius***  Distance between the reference point and the edge of the satellite or beam coverage. Unit in km.  Step of 10 km. Actual value = field value \* 10. |
| ***serviceInfo***  Information on when the satellite will provide coverage.  E-UTRAN always configures *tle-ephemerisParameters* for satellite with earth moving cell and always configures *t-ServiceStart* for quasi-earth fixed satellite. |
| ***tle-ephemerisParameters***  Mean values of the satellite orbital parameters in TLE format for estimating out-of-coverage for satellite with earth moving cell, see TS 36.304 [4]. |
| ***t-ServiceStart***  Time information on when the incoming satellite is going to start serving the area for quasi-earth fixed satellite. |

### 6.3.2 Radio resource control information elements

#### – *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

Alpha-r12 ::= ENUMERATED {al0, al04, al05, al06, al07, al08, al09, al1}

-- ASN1STOP

#### – *AntennaInfo*

The IE *AntennaInfoCommon* and the *AntennaInfoDedicated* are used to specify the common and the UE specific antenna configuration respectively.

*AntennaInfo* information elements

-- ASN1START

AntennaInfoCommon ::= SEQUENCE {

antennaPortsCount ENUMERATED {an1, an2, an4, spare1}

}

AntennaInfoDedicated ::= SEQUENCE {

transmissionMode ENUMERATED {

tm1, tm2, tm3, tm4, tm5, tm6,

tm7, tm8-v920},

codebookSubsetRestriction CHOICE {

n2TxAntenna-tm3 BIT STRING (SIZE (2)),

n4TxAntenna-tm3 BIT STRING (SIZE (4)),

n2TxAntenna-tm4 BIT STRING (SIZE (6)),

n4TxAntenna-tm4 BIT STRING (SIZE (64)),

n2TxAntenna-tm5 BIT STRING (SIZE (4)),

n4TxAntenna-tm5 BIT STRING (SIZE (16)),

n2TxAntenna-tm6 BIT STRING (SIZE (4)),

n4TxAntenna-tm6 BIT STRING (SIZE (16))

} OPTIONAL, -- Cond TM

ue-TransmitAntennaSelection CHOICE{

release NULL,

setup ENUMERATED {closedLoop, openLoop}

}

}

AntennaInfoDedicated-v920 ::= SEQUENCE {

codebookSubsetRestriction-v920 CHOICE {

n2TxAntenna-tm8-r9 BIT STRING (SIZE (6)),

n4TxAntenna-tm8-r9 BIT STRING (SIZE (32))

} OPTIONAL -- Cond TM8

}

AntennaInfoDedicated-r10 ::= SEQUENCE {

transmissionMode-r10 ENUMERATED {

tm1, tm2, tm3, tm4, tm5, tm6, tm7, tm8-v920,

tm9-v1020, tm10-v1130, spare6, spare5, spare4,

spare3, spare2, spare1},

codebookSubsetRestriction-r10 BIT STRING OPTIONAL, -- Cond TMX

ue-TransmitAntennaSelection CHOICE{

release NULL,

setup ENUMERATED {closedLoop, openLoop}

}

}

AntennaInfoDedicated-v10i0::= SEQUENCE {

maxLayersMIMO-r10 ENUMERATED {twoLayers, fourLayers, eightLayers} OPTIONAL -- Need OR

}

AntennaInfoDedicated-v1250 ::= SEQUENCE {

alternativeCodebookEnabledFor4TX-r12 BOOLEAN

}

AntennaInfoDedicated-v1430 ::= SEQUENCE {

ce-UE-TxAntennaSelection-config-r14 ENUMERATED {on} OPTIONAL -- Need OR

}

AntennaInfoDedicatedSTTI-r15 ::= CHOICE {

release NULL,

setup SEQUENCE {

transmissionModeDL-MBSFN-r15 ENUMERATED {tm9, tm10} OPTIONAL, -- Need OR

transmissionModeDL-nonMBSFN-r15 ENUMERATED {tm1, tm2, tm3, tm4, tm6, tm8, tm9,

tm10} OPTIONAL, --\_Need OR

codebookSubsetRestriction CHOICE {

n2TxAntenna-tm3-r15 BIT STRING (SIZE (2)),

n4TxAntenna-tm3-r15 BIT STRING (SIZE (4)),

n2TxAntenna-tm4-r15 BIT STRING (SIZE (6)),

n4TxAntenna-tm4-r15 BIT STRING (SIZE (64)),

n2TxAntenna-tm5-r15 BIT STRING (SIZE (4)),

n4TxAntenna-tm5-r15 BIT STRING (SIZE (16)),

n2TxAntenna-tm6-r15 BIT STRING (SIZE (4)),

n4TxAntenna-tm6-r15 BIT STRING (SIZE (16)),

n2TxAntenna-tm8-r15 BIT STRING (SIZE (6)),

n4TxAntenna-tm8-r15 BIT STRING (SIZE (64)),

n2TxAntenna-tm9and10-r15 BIT STRING (SIZE (6)),

n4TxAntenna-tm9and10-r15 BIT STRING (SIZE (96)),

n8TxAntenna-tm9and10-r15 BIT STRING (SIZE (109))

} OPTIONAL, -- Cond TM

maxLayersMIMO-STTI-r15 ENUMERATED {twoLayers, fourLayers} OPTIONAL, -- Need OR

slotSubslotPDSCH-TxDiv-2Layer-r15 BOOLEAN,

slotSubslotPDSCH-TxDiv-4Layer-r15 BOOLEAN

}

}

AntennaInfoDedicated-v1530 ::= CHOICE {

release NULL,

setup CHOICE {

ue-TxAntennaSelection-SRS-1T4R-Config-r15 NULL,

ue-TxAntennaSelection-SRS-2T4R-NrOfPairs-r15 ENUMERATED {two, three}

}

}

-- ASN1STOP

| *AntennaInfo* field descriptions |
| --- |
| ***alternativeCodebookEnabledFor4TX***  Indicates whether code book in TS 36.213 [23] Table 7.2.4-0A to Table 7.2.4-0D is being used for deriving CSI feedback and reporting. E-UTRAN only configures the field if the UE is configured with a) *tm8* with 4 CRS ports, *tm9* or *tm10* with 4 CSI-RS ports and b) PMI/RI reporting. |
| ***antennaPortsCount***  Parameter represents the number of cell specific antenna ports where an1 corresponds to 1, an2 to 2 antenna ports etc. see TS 36.211 [21], clause 6.2.1. |
| ***ce-ue-TxAntennaSelection-config***  Configuration of UL closed-loop transmit antenna selection for non-BL UE in CE Mode A, see TS 36.212 [22]. |
| ***codebookSubsetRestriction***  Parameter: *codebookSubsetRestriction,* see TS 36.213 [23], clause 7.2 and TS 36.211 [21], clause 6.3.4.2.3. The number of bits in the *codebookSubsetRestriction* for applicable transmission modes is defined in TS 36.213 [23], Table 7.2-1b. If the UE is configured with *transmissionMode* tm8, E-UTRAN configures the field *codebookSubsetRestriction* if PMI/RI reporting is configured. If the UE is configured with *transmissionMode* tm9, E-UTRAN configures the field *codebookSubsetRestriction* if PMI/RI reporting is configured and if the number of CSI-RS ports is greater than 1. E-UTRAN does not configure the field *codebookSubsetRestriction* in other cases where the UE is configured with *transmissionMode* tm8 or tm9. Furthermore, E-UTRAN does not configure the field *codebookSubsetRestriction* if the UE is configured with *eMIMO-Type* unless it is set to *beamformed*, *alternativeCodebookEnabledBeamformed* is set to *FALSE* and *csi-RS-ConfigNZPIdListExt* is not configured. |
| ***maxLayersMIMO***  Indicates the maximum number of layers for spatial multiplexing used to determine the rank indication bit width and Kc determination of the soft buffer size for the corresponding serving cell according to TS 36.212 [22]. EUTRAN configures this field only when *transmissionMode* is set to *tm3*, *tm4*, *tm9* or *tm10* for the corresponding serving cell. When configuring the field for a serving cell which *transmissionMode* is set to *tm3* or *tm4*, EUTRAN only configures value *fourLayers*: For a serving cell which *transmissionMode* is set to *tm9* or *tm10*, EUTRAN only configures the field only if *intraBandContiguousCC-InfoList* or *FeatureSetDL-PerCC* is indicated for the band and the band combination of the corresponding serving cell or the UE supports *maxLayersMIMO-Indication*. |
| ***maxLayersMIMO-STTI***  Indicates the maximum number of layers, for each serving cell, to be used when determining if the shifted DMRS pattern is applicable TS 36.211 [21], clause 6.10.3.2. |
| ***slotSubslotPDSCH-TxDiv-2Layer, slotSubslotPDSCH-TxDiv-4Layer***  Indicates the table to be used in case of dynamic TX diversity fallback for TM9 and 10 for up to 2-layer/4-layer slot or subslot PDSCH operation, see TS 36.212 [22], clause 5.3.3.1.22. |
| ***transmissionMode***  Points to one of Transmission modes defined in TS 36.213 [23], clause 7.1, where tm1 refers to transmission mode 1, tm2 to transmission mode 2 etc. |
| ***transmissionModeDL-MBSFN***  Indicates, for MBSFN, the transmission mode as defined in TS 36.213 [23], clause 7.1, where *tm1* refers to transmission mode 1, *tm2* to transmission mode 2 etc for slot or subslot operation. In case of FDD, TM8 is not applicable. |
| ***transmissionModeDL-nonMBSFN***  Indicates, for non-MBSFN, the transmission mode as defined in TS 36.213 [23], clause 7.1, where *tm1* refers to transmission mode 1, *tm2* to transmission mode 2 etc. for slot or subslot operation. In case of FDD, TM8 is not applicable. |
| ***ue-TransmitAntennaSelection***  For value *setup,* the field indicates whether UE transmit antenna selection control is closed-loop or open-loop as described in TS 36.213 [23], clause 8.7. |
| ***ue-TxAntennaSelection-SRS-1T4R-Config***  Configuration of UL closed-loop transmit antenna selection for UE to select one antenna among four antennas to transmit SRS for the corresponding serving cell as described in TS 36.213 [23]. When *ue-TxAntennaSelection-SRS-1T4R-Config* and *ue-TransmitAntennaSelection* are configured simultaneously for a given serving cell, the UE selects one of the first two antennas for PUSCH transmission and selects one antenna among four antennas at each SRS instance for SRS transmission for the corresponding serving cell as described in TS 36.213 [23]. |
| ***ue-TxAntennaSelection-SRS-2T4R-NrOfPairs***  Presence of the field indicates configuration of UL closed-loop transmit antenna selection for UE to select two antennas among four antennas to transmit SRS simultaneously for the corresponding serving cell as described in TS 36.213 [23]. Further, the field indicates the number of antenna pairs to select from for SRS transmission for a given serving cell as described in TS 36.213 [23]. Value two indicates the UE to select one antenna pair between two antenna pairs to transmit SRS simultaneously at each SRS instance for the corresponding serving cell. Value three indicates the UE to select one antenna pair among three antenna pairs to transmit SRS simultaneously at each SRS instance for the corresponding serving cell. EUTRAN does not simultaneously configure *ue-TransmitAntennaSelection* and *ue-TxAntennaSelection-SRS-2T4R-NrOfPairs* for a given serving cell. |

| Conditional presence | Explanation |
| --- | --- |
| *TM* | The field is mandatory present if the *transmissionMode* is set to tm3, tm4, tm5 or tm6. Otherwise the field is not present and the UE shall delete any existing value for this field. |
| *TM8* | The field is optional present, need OR, if *AntennaInfoDedicated* is included and *transmissionMode* is set to *tm8*. If *AntennaInfoDedicated* is included and *transmissionMode* is set to a value other than *tm8*, the field is not present and the UE shall delete any existing value for this field. Otherwise the field is not present. |
| *TMX* | The field is mandatory present if the *transmissionMode-r10* is set to *tm3*, *tm4*, *tm5* or *tm6*. The field is optionally present, need OR, if the *transmissionMode-r10* is set to *tm8* or *tm9*. Otherwise the field is not present and the UE shall delete any existing value for this field. |

#### *– AntennaInfoUL*

The IE *AntennaInfoUL* is used to specify the UL antenna configuration.

*AntennaInfoUL* information elements

-- ASN1START

AntennaInfoUL-r10 ::= SEQUENCE {

transmissionModeUL-r10 ENUMERATED {tm1, tm2, spare6, spare5,

spare4, spare3, spare2, spare1} OPTIONAL, -- Need OR

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

}

AntennaInfoUL-STTI-r15 ::= SEQUENCE {

transmissionModeUL-STTI-r15 ENUMERATED {tm1, tm2} OPTIONAL -- Need OR

}

-- ASN1STOP

| *AntennaInfoUL* field descriptions |
| --- |
| ***fourAntennaPortActivated***  Parameter indicates if four antenna ports are used. See TS 36.213 [23], clause 8.2. E-UTRAN optionally configures *fourAntennaPortActivated* only if *transmissionModeUL* is set to *tm2*. |
| ***transmissionModeUL***  Points to one of UL Transmission modes defined in TS 36.213 [23], clause 8.0, where tm1 refers to transmission mode 1, tm2 to transmission mode 2 etc. |
| ***transmissionModeUL-STTI***  Indicates the UL transmission mode as defined in TS 36.213 [23], clause 8.0, where tm1 refers to transmission mode 1 and tm2 to transmission mode 2 for slot or subslot operation. |

#### – *AUL-Config*

The IE *AUL-Config* is used to specify the autonomous uplink configuration.

*AUL-Config* information element

-- ASN1START

AUL-Config-r15 ::= CHOICE {

release NULL,

setup SEQUENCE {

aul-CRNTI-r15 C-RNTI,

aul-Subframes-r15 BIT STRING (SIZE (40))**,**

aul-HARQ-Processes-r15 INTEGER (1..16),

transmissionModeUL-AUL-r15 ENUMERATED {tm1,tm2},

aul-StartingFullBW-InsideMCOT-r15 BIT STRING (SIZE (5)),

aul-StartingFullBW-OutsideMCOT-r15 BIT STRING (SIZE (7)),

aul-StartingPartialBW-InsideMCOT-r15 ENUMERATED {o34, o43, o52, o61, oOS1},

aul-StartingPartialBW-OutsideMCOT-r15 ENUMERATED {o16, o25, o34, o43, o52, o61, oOS1},

aul-RetransmissionTimer-r15 ENUMERATED {psf4, psf5, psf6, psf8, psf10, psf12, psf20, psf28, psf37, psf44, psf68, psf84, psf100,

psf116, psf132, psf164, psf324},

endingSymbolAUL-r15 INTEGER(12..13),

subframeOffsetCOT-Sharing-r15 INTEGER(2..4),

contentionWindowSizeTimer-r15 ENUMERATED {n0, n5, n10}

}

}

-- ASN1STOP

| *AUL-Config* field descriptions |
| --- |
| ***aul-CRNTI***  AUL C-RNTI, see TS 36.321 [6]. |
| ***aul-HARQ-Processes***  This field indicates which HARQ process IDs are configured for AUL operation as described in TS 36.321 [6]. In case tm1 is configured for the *transmissionModeUL-AUL* the number of configured HARQ processes equals to field value. In case tm2 is configured for the *transmissionModeUL-AUL* the number of configured HARQ processes equals to double of the field value. The largest value of the HARQ process ID is equal to the number of configured HARQ processes - 1. |
| ***aul-RetransmissionTimer***  This timer is used to restrict both new transmission and retransmission for the same HARQ process for AUL operation as described in TS 36.321 [6]. Value psf4 corresponds to 4 PDCCH subframes etc. |
| ***aul-StartingFullBW-InsideMCOT***  This field indicates the AUL-specific set of PUSCH starting offset values for the AUL transmission inside of eNB obtained MCOT when a UE configured with AUL configuration is allocated to occupy the full channel bandwidth as described in TS 36.213 [23], clause 8.0. The first/leftmost bit corresponds to value 34, second bit corresponds to value 43, third bit corresponds to value 52, fourth bit corresponds to value 61 and last bit corresponds to value OS#1. |
| ***aul-StartingFullBW-OutsideMCOT***  This field indicates the AUL-specific set of PUSCH starting offset values for the AUL transmission outside of eNB obtained MCOT when a UE configured with AUL configuration is allocated to occupy the full channel bandwidth as described in TS 36.213 [23], clause 8.0. The first/leftmost bit corresponds to value 16, second bit corresponds to value 25, third bit corresponds to value 34, fourth bit corresponds to value 43, fifth bit corresponds to value 52, sixth bit corresponds to value 61 and last bit corresponds to value OS#1. |
| ***aul-StartingPartialBW-InsideMCOT***  This field indicates the exact AUL-specific PUSCH starting offset value for the AUL transmission inside of eNB obtained MCOT when a UE configured with AUL configuration is allocated to occupy partial channel bandwidth as described in TS 36.213 [23], clause 8.0. The value o34 corresponds to 34, and the value o43 corresponds to 43 and so on. |
| ***aul-StartingPartialBW-OutsideMCOT***  This field indicates the exact AUL-specific PUSCH starting offset value for the AUL transmission outside of eNB obtained MCOT when a UE configured with AUL configuration is allocated to occupy partial channel bandwidth as described in TS 36.213 [23], clause 8.0. The value o16 corresponds to 16, the value o25 corresponds to 25 and so on. |
| ***aul-Subframes***  This field indicates which subframes are allowed for AUL operation as described in TS 36.321 [6]. The first/leftmost bit corresponds to the subframe #0 of the radio frame satisfying SFN mod 4 = 0. Value 0 in the bitmap indicates that the corresponding subframe is not allowed for AUL. Value 1 in the bitmap indicates that the corresponding subframe is allowed for AUL. |
| ***contentionWindowSizeTimer***  This field indicates contention window size adjustment timer as described in TS 37.213 [94], clause 4.2.2. The value n0 corresponds to 0ms, value n5 corresponds to 5ms, value n10 corresponds to 10ms. The value is set to n0 or n5 if the absence of other technologies on the same carrier cannot be guaranteed. The value is set to n0 or n10 if the absence of other technologies on the same carrier can be guaranteed. |
| ***endingSymbolAUL***  This field indicates PUSCH ending symbol of the last AUL subframe in an AUL burst as described in TS 36.211 [21], clause 4.1.3. |
| ***subframeOffsetCOT-Sharing***  This field is COT sharing indication parameter X indicating if subframe n+X is an applicable subframe for UL to DL sharing as described in TS 37.213 [94], clause 4.1.3. |
| ***transmissionModeUL-AUL***  This field indicates which UL transmission mode is used for AUL as described in TS 36.213 [23], clause 8.0, where tm1 refers to transmission mode 1, tm2 to transmission mode 2. |

#### – *CQI-ReportAperiodic*

The IE *CQI-ReportAperiodic* is used to specify the aperiodic CQI reporting configuration.

*CQI-ReportAperiodic* information elements

-- ASN1START

CQI-ReportAperiodic-r10 ::= CHOICE {

release NULL,

setup SEQUENCE {

cqi-ReportModeAperiodic-r10 CQI-ReportModeAperiodic,

aperiodicCSI-Trigger-r10 SEQUENCE {

trigger1-r10 BIT STRING (SIZE (8)),

trigger2-r10 BIT STRING (SIZE (8))

} OPTIONAL -- Need OR

}

}

CQI-ReportAperiodic-v1250 ::= CHOICE {

release NULL,

setup SEQUENCE {

aperiodicCSI-Trigger-v1250 SEQUENCE {

trigger-SubframeSetIndicator-r12 ENUMERATED {s1, s2},

trigger1-SubframeSetIndicator-r12 BIT STRING (SIZE (8)),

trigger2-SubframeSetIndicator-r12 BIT STRING (SIZE (8))

}

}

}

CQI-ReportAperiodic-v1310 ::= CHOICE {

release NULL,

setup SEQUENCE {

aperiodicCSI-Trigger-v1310 SEQUENCE {

trigger1-r13 BIT STRING (SIZE (32)),

trigger2-r13 BIT STRING (SIZE (32)),

trigger3-r13 BIT STRING (SIZE (32)),

trigger4-r13 BIT STRING (SIZE (32)),

trigger5-r13 BIT STRING (SIZE (32)),

trigger6-r13 BIT STRING (SIZE (32))

} OPTIONAL, -- Need ON

aperiodicCSI-Trigger2-r13 CHOICE {

release NULL,

setup SEQUENCE {

trigger1-SubframeSetIndicator-r13 BIT STRING (SIZE (32)),

trigger2-SubframeSetIndicator-r13 BIT STRING (SIZE (32)),

trigger3-SubframeSetIndicator-r13 BIT STRING (SIZE (32)),

trigger4-SubframeSetIndicator-r13 BIT STRING (SIZE (32)),

trigger5-SubframeSetIndicator-r13 BIT STRING (SIZE (32)),

trigger6-SubframeSetIndicator-r13 BIT STRING (SIZE (32))

}

} OPTIONAL -- Need ON

}

}

CQI-ReportAperiodicProc-r11 ::= SEQUENCE {

cqi-ReportModeAperiodic-r11 CQI-ReportModeAperiodic,

trigger01-r11 BOOLEAN,

trigger10-r11 BOOLEAN,

trigger11-r11 BOOLEAN

}

CQI-ReportAperiodicProc-v1310 ::= SEQUENCE {

trigger001-r13 BOOLEAN,

trigger010-r13 BOOLEAN,

trigger011-r13 BOOLEAN,

trigger100-r13 BOOLEAN,

trigger101-r13 BOOLEAN,

trigger110-r13 BOOLEAN,

trigger111-r13 BOOLEAN

}

CQI-ReportAperiodicHybrid-r14 ::= SEQUENCE {

triggers-r14 CHOICE {

oneBit-r14 SEQUENCE {

trigger1-Indicator-r14 BIT STRING (SIZE (8))

},

twoBit-r14 SEQUENCE {

trigger01-Indicator-r14 BIT STRING (SIZE (8)),

trigger10-Indicator-r14 BIT STRING (SIZE (8)),

trigger11-Indicator-r14 BIT STRING (SIZE (8))

},

threeBit-r14 SEQUENCE {

trigger001-Indicator-r14 BIT STRING (SIZE (32)),

trigger010-Indicator-r14 BIT STRING (SIZE (32)),

trigger011-Indicator-r14 BIT STRING (SIZE (32)),

trigger100-Indicator-r14 BIT STRING (SIZE (32)) ,

trigger101-Indicator-r14 BIT STRING (SIZE (32)),

trigger110-Indicator-r14 BIT STRING (SIZE (32)),

trigger111-Indicator-r14 BIT STRING (SIZE (32))

}

} OPTIONAL -- Need OR

}

CQI-ReportModeAperiodic ::= ENUMERATED {

rm12, rm20, rm22, rm30, rm31,

rm32-v1250, rm10-v1310, rm11-v1310

}

-- ASN1STOP

| *CQI-ReportAperiodic* field descriptions |
| --- |
| ***aperiodicCSI-Trigger***  Indicates for which serving cell(s) the aperiodic CSI report is triggered when one or more SCells are configured. *trigger1-r10* corresponds to the CSI request field 10 while *trigger1-r13* corresponds to the CSI request field 010, *trigger2-r10* corresponds to the CSI request field 11 while *trigger2-r13* corresponds to the CSI request field 011, *trigger3-r13* corresponds to the CSI request field 100, see TS 36.213 [23], table 7.2.1-1A and table 7.2.1-1D, and so on. The leftmost bit, bit 0 in the bit string corresponds to the cell with *ServCellIndex*=0 and bit 1 in the bit string corresponds to the cell with *ServCellIndex*=1 etc. Each bit has either value 0 (means no aperiodic CSI report is triggered) or value 1 (means the aperiodic CSI report is triggered). At most 5 bits can be set to value 1 in the bit string in *aperidociCSI-Trigger-r10* and in *aperiodicCSI-Trigger-v1250* and at most 32 bits can be set to value 1 in the bit string in *aperiodicCSI-Trigger-v1310*. E-UTRAN configures value 1 only for cells configured with *transmissionMode* set in range *tm1 to tm9*. One value applies for all serving cells configured with *transmissionMode* set in range *tm1 to tm9* and belonging to the same PUCCH group (the associated functionality is common i.e. not performed independently for each cell). |
| ***trigger-SubframeSetIndicator***  For a serving cell configured with *csi-MeasSubframeSets-r12,* indicates for which CSI subframe set the aperiodic CSI report is triggered for the serving cell if the aperiodic CSI is triggered by the CSI request field 01 or 001, see TS 36.213 [23], table 7.2.1-1C or table 7.2.1.-1E. Value s1 corresponds to CSI subframe set 1 and value s2 corresponds to CSI subframe set 2. |
| ***trigger001***  Indicates whether or not reporting for this CSI-process or reporting for this CSI-process corresponding to a CSI subframe set is triggered by CSI request field set to 001, for a CSI request applicable for the serving cell on the same frequency as the CSI process, see TS 36.213 [23], table 7.2.1-1D and 7.2.1-E. |
| ***trigger001-IndicatorN.. trigger111-IndicatorN***  Indicates for which eMIMO-Type the aperiodic CSI report is triggered (the corresponding CSI process, CSI subframe set}-pair(s) and/or a serving cell) as applicable, See TS 36.213 [23], table 7.2.1-1A, 7.2.1-1B, and 7.2.1-1C. |
| ***trigger01***  Indicates whether or not reporting for this CSI-process or reporting for this CSI-process corresponding to a CSI subframe set is triggered by CSI request field set to 01, for a CSI request applicable for the serving cell on the same frequency as the CSI process, see TS 36.213 [23], table 7.2.1-1D and 7.2.1-1E. |
| ***trigger010, trigger011, trigger100, trigger101, Trigger110, Trigger111***  Indicates whether or not reporting for this CSI-process or reporting for this CSI-process corresponding to a CSI subframe set is triggered by CSI request field set to 010, 011, 100, 101, 110 or 111, see TS 36.213 [23], table 7.2.1-1D and 7.2.1-1E. |
| ***trigger10, trigger11***  Indicates whether or not reporting for this CSI-process or reporting for this CSI-process corresponding to a CSI subframe set is triggered by CSI request field set to 10 or 11, see TS 36.213 [23], table 7.2.1-1B. EUTRAN configures at most 5 CSI processes, across all serving frequencies within each CG, to be triggered by a CSI request field set to value 10. The same restriction applies for value 11. In case E-UTRAN simultaneously triggers CSI requests for more than 5 CSI processes some limitations apply, see TS 36.213 [23]. |
| ***trigger1-SubframeSetIndicator***  If signalled in the *aperiodicCSI-Trigger-v1250*, indicates for which CSI subframe set the aperiodic CSI report is triggered when aperiodic CSI is triggered by the CSI request field 10, see TS 36.213 [23], table 7.2.1-1C, or by the CSI request field 010, see TS 36.213 [23], table 7.2.1-1E.The leftmost bit, bit 0 in the bit string corresponds to the cell with *ServCellIndex*=0 and bit 1 in the bit string corresponds to the cell with *ServCellIndex*=1 etc. Each bit has either value 0 (means that aperiodic CSI report is triggered for CSI subframe set 1) or value 1 (means that aperiodic CSI report is triggered for CSI subframe set 2). |
| ***trigger2-SubframeSetIndicator***  If signalled in the *aperiodicCSI-Trigger-v1250*, indicates for which CSI subframe set the aperiodic CSI report is triggered when aperiodic CSI is triggered by the CSI request field 11, see TS 36.213 [23], table 7.2.1-1C, or by the CSI request field 011, see TS 36.213 [23], table 7.2.1-1E.The leftmost bit, bit 0 in the bit string corresponds to the cell with *ServCellIndex*=0 and bit 1 in the bit string corresponds to the cell with *ServCellIndex*=1 etc. Each bit has either value 0 (means that aperiodic CSI report is triggered for CSI subframe set 1) or value 1 (means that aperiodic CSI report is triggered for CSI subframe set 2). |
| ***trigger3-SubframeSetIndicator***  Indicates for which CSI subframe set the aperiodic CSI report is triggered when aperiodic CSI is triggered by the CSI request field100, see TS 36.213 [23], table 7.2.1-1E.The leftmost bit, bit 0 in the bit string corresponds to the cell with *ServCellIndex*=0 and bit 1 in the bit string corresponds to the cell with *ServCellIndex* =1 etc. Each bit has either value 0 (means that aperiodic CSI report is triggered for CSI subframe set 1) or value 1 (means that aperiodic CSI report is triggered for CSI subframe set 2). |
| ***trigger4-SubframeSetIndicator***  Indicates for which CSI subframe set the aperiodic CSI report is triggered when aperiodic CSI is triggered by the CSI request field 101, see TS 36.213 [23], table 7.2.1-1E.The leftmost bit, bit 0 in the bit string corresponds to the cell with ServCellIndex=0 and bit 1 in the bit string corresponds to the cell with *ServCellIndex* =1 etc. Each bit has either value 0 (means that aperiodic CSI report is triggered for CSI subframe set 1) or value 1 (means that aperiodic CSI report is triggered for CSI subframe set 2). |
| ***trigger5-SubframeSetIndicator***  Indicates for which CSI subframe set the aperiodic CSI report is triggered when aperiodic CSI is triggered by the CSI request field 110, see TS 36.213 [23], table 7.2.1-1E.The leftmost bit, bit 0 in the bit string corresponds to the cell with ServCellIndex=0 and bit 1 in the bit string corresponds to the cell with *ServCellIndex* =1 etc. Each bit has either value 0 (means that aperiodic CSI report is triggered for CSI subframe set 1) or value 1 (means that aperiodic CSI report is triggered for CSI subframe set 2). |
| ***trigger6-SubframeSetIndicator***  Indicates for which CSI subframe set the aperiodic CSI report is triggered when aperiodic CSI is triggered by the CSI request field 111, see TS 36.213 [23], table 7.2.1-1E.The leftmost bit, bit 0 in the bit string corresponds to the cell with ServCellIndex=0 and bit 1 in the bit string corresponds to the cell with *ServCellIndex* =1 etc. Each bit has either value 0 (means that aperiodic CSI report is triggered for CSI subframe set 1) or value 1 (means that aperiodic CSI report is triggered for CSI subframe set 2). |

#### – *CQI-ReportBoth*

The IE *CQI-ReportBoth* is used to specify the CQI reporting configuration common to both periodic and aperiodic configurations.

*CQI-ReportBoth* information elements

-- ASN1START

CQI-ReportBoth-r11 ::= SEQUENCE {

csi-IM-ConfigToReleaseList-r11 CSI-IM-ConfigToReleaseList-r11 OPTIONAL, -- Need ON

csi-IM-ConfigToAddModList-r11 CSI-IM-ConfigToAddModList-r11 OPTIONAL, -- Need ON

csi-ProcessToReleaseList-r11 CSI-ProcessToReleaseList-r11 OPTIONAL, -- Need ON

csi-ProcessToAddModList-r11 CSI-ProcessToAddModList-r11 OPTIONAL -- Need ON

}

CQI-ReportBoth-v1250 ::= SEQUENCE {

csi-IM-ConfigToReleaseListExt-r12 CSI-IM-ConfigId-v1250 OPTIONAL, -- Need ON

csi-IM-ConfigToAddModListExt-r12 CSI-IM-ConfigExt-r12 OPTIONAL -- Need ON

}

CQI-ReportBoth-v1310 ::= SEQUENCE {

csi-IM-ConfigToReleaseListExt-r13 CSI-IM-ConfigToReleaseListExt-r13 OPTIONAL, -- Need ON

csi-IM-ConfigToAddModListExt-r13 CSI-IM-ConfigToAddModListExt-r13 OPTIONAL -- Need ON

}

CSI-IM-ConfigToAddModList-r11 ::= SEQUENCE (SIZE (1..maxCSI-IM-r11)) OF CSI-IM-Config-r11

CSI-IM-ConfigToAddModListExt-r13 ::= SEQUENCE (SIZE (1..maxCSI-IM-v1310)) OF CSI-IM-ConfigExt-r12

CSI-IM-ConfigToReleaseList-r11 ::= SEQUENCE (SIZE (1..maxCSI-IM-r11)) OF CSI-IM-ConfigId-r11

CSI-IM-ConfigToReleaseListExt-r13 ::= SEQUENCE (SIZE (1..maxCSI-IM-v1310)) OF CSI-IM-ConfigId-v1310

CSI-ProcessToAddModList-r11 ::= SEQUENCE (SIZE (1..maxCSI-Proc-r11)) OF CSI-Process-r11

CSI-ProcessToReleaseList-r11 ::= SEQUENCE (SIZE (1..maxCSI-Proc-r11)) OF CSI-ProcessId-r11

CQI-ReportBothProc-r11 ::= SEQUENCE {

ri-Ref-CSI-ProcessId-r11 CSI-ProcessId-r11 OPTIONAL, -- Need OR

pmi-RI-Report-r11 ENUMERATED {setup} OPTIONAL -- Need OR

}

-- ASN1STOP

| *CQI-ReportBoth* field descriptions |
| --- |
| ***csi-IM-ConfigToAddModList***  For a serving frequency E-UTRAN configures one or more *CSI-IM-Config* only when transmission mode 10 is configured for the serving cell on this carrier frequency. |
| ***csi-ProcessToAddModList***  For a serving frequency E-UTRAN configures one or more *CSI-Process* only when transmission mode 10 is configured for the serving cell on this carrier frequency. |
| ***cqi-ReportModeAperiodic***  Parameter: *reporting mode.* Value rm12 corresponds to Mode 1-2, rm20 corresponds to Mode 2-0, rm22 corresponds to Mode 2-2 etc. PUSCH reporting modes are described in TS 36.213 [23], clause 7.2.1. The UE shall ignore *cqi-ReportModeAperiodic-r10* when transmission mode 10 is configured for the serving cell on this carrier frequency. The UE shall ignore *cqi-ReportModeAperiodic-r10* configured for the PCell/ PSCell when the transmission bandwidth of the PCell/PSCell in downlink is 6 resource blocks. |
| ***pmi-RI-Report***  See TS 36.213 [23], clause 7.2. The presence of this field means PMI/RI reporting is configured; otherwise the PMI/RI reporting is not configured. EUTRAN configures this field only when *transmissionMode* is set to *tm8, tm9* or *tm10*. The UE shall ignore *pmi-RI-Report-r9*/ *pmi-RI-Report-r10* when transmission mode 10 is configured for the serving cell on this carrier frequency. |
| ***ri-Ref-CSI-ProcessId***  CSI process whose RI value the UE inherits when reporting RI, in the same subframe, for CSI reporting. E-UTRAN ensures that the CSI process that inherits the RI value is configured in accordance with the conditions specified in TS 36.213 [23], clauses 7.2.1 and 7.2.2. |

#### – *CQI-ReportConfig*

The IE *CQI-ReportConfig* is used to specify the CQI reporting configuration.

*CQI-ReportConfig* information elements

-- ASN1START

CQI-ReportConfig ::= SEQUENCE {

cqi-ReportModeAperiodic CQI-ReportModeAperiodic OPTIONAL,  -- Need OR

nomPDSCH-RS-EPRE-Offset INTEGER (-1..6),

cqi-ReportPeriodic CQI-ReportPeriodic OPTIONAL -- Need ON

}

CQI-ReportConfig-v920 ::= SEQUENCE {

cqi-Mask-r9 ENUMERATED {setup} OPTIONAL, -- Cond cqi-Setup

pmi-RI-Report-r9 ENUMERATED {setup} OPTIONAL -- Cond PMIRI

}

CQI-ReportConfig-r10 ::= SEQUENCE {

cqi-ReportAperiodic-r10 CQI-ReportAperiodic-r10 OPTIONAL, -- Need ON

nomPDSCH-RS-EPRE-Offset INTEGER (-1..6),

cqi-ReportPeriodic-r10 CQI-ReportPeriodic-r10 OPTIONAL, -- Need ON

pmi-RI-Report-r9 ENUMERATED {setup} OPTIONAL, -- Cond PMIRIPCell

csi-SubframePatternConfig-r10 CHOICE {

release NULL,

setup SEQUENCE {

csi-MeasSubframeSet1-r10 MeasSubframePattern-r10,

csi-MeasSubframeSet2-r10 MeasSubframePattern-r10

}

} OPTIONAL -- Need ON

}

CQI-ReportConfig-v1130 ::= SEQUENCE {

cqi-ReportPeriodic-v1130 CQI-ReportPeriodic-v1130,

cqi-ReportBoth-r11 CQI-ReportBoth-r11

}

CQI-ReportConfig-v1250 ::= SEQUENCE {

csi-SubframePatternConfig-r12 CHOICE {

release NULL,

setup SEQUENCE {

csi-MeasSubframeSets-r12 BIT STRING (SIZE (10))

}

} OPTIONAL, -- Need ON

cqi-ReportBoth-v1250 CQI-ReportBoth-v1250 OPTIONAL, -- Need ON

cqi-ReportAperiodic-v1250 CQI-ReportAperiodic-v1250 OPTIONAL, -- Need ON

altCQI-Table-r12 ENUMERATED {

allSubframes, csi-SubframeSet1,

csi-SubframeSet2, spare1} OPTIONAL -- Need OP

}

CQI-ReportConfig-v1310 ::= SEQUENCE {

cqi-ReportBoth-v1310 CQI-ReportBoth-v1310 OPTIONAL, -- Need ON

cqi-ReportAperiodic-v1310 CQI-ReportAperiodic-v1310 OPTIONAL, -- Need ON

cqi-ReportPeriodic-v1310 CQI-ReportPeriodic-v1310 OPTIONAL -- Need ON

}

CQI-ReportConfig-v1320 ::= SEQUENCE {

cqi-ReportPeriodic-v1320 CQI-ReportPeriodic-v1320 OPTIONAL -- Need ON

}

CQI-ReportConfig-v1430 ::= SEQUENCE {

cqi-ReportAperiodicHybrid-r14 CQI-ReportAperiodicHybrid-r14 OPTIONAL -- Need ON

}

CQI-ReportConfig-v1530 ::= SEQUENCE {

altCQI-Table-1024QAM-r15 ENUMERATED {

allSubframes, csi-SubframeSet1,

csi-SubframeSet2, spare1} OPTIONAL -- Need OP

}

CQI-ReportConfig-r15 ::= CHOICE {

release NULL,

setup SEQUENCE {

cqi-ReportConfig-r10 CQI-ReportConfig-r10 OPTIONAL, -- Need ON

cqi-ReportConfig-v1130 CQI-ReportConfig-v1130 OPTIONAL, -- Need ON

cqi-ReportConfigPCell-v1250 CQI-ReportConfig-v1250 OPTIONAL, -- Need ON

cqi-ReportConfig-v1310 CQI-ReportConfig-v1310 OPTIONAL, -- Need ON

cqi-ReportConfig-v1320 CQI-ReportConfig-v1320 OPTIONAL, -- Need ON

cqi-ReportConfig-v1430 CQI-ReportConfig-v1430 OPTIONAL, -- Need ON

altCQI-Table-1024QAM-r15 ENUMERATED {allSubframes, csi-SubframeSet1,

csi-SubframeSet2, spare1} OPTIONAL -- Need OP

}

}

CQI-ReportConfigSCell-r10 ::= SEQUENCE {

cqi-ReportModeAperiodic-r10 CQI-ReportModeAperiodic OPTIONAL, -- Need OR

nomPDSCH-RS-EPRE-Offset-r10 INTEGER (-1..6),

cqi-ReportPeriodicSCell-r10 CQI-ReportPeriodic-r10 OPTIONAL, -- Need ON

pmi-RI-Report-r10 ENUMERATED {setup} OPTIONAL -- Cond PMIRISCell

}

CQI-ReportConfigSCell-r15 ::= SEQUENCE {

cqi-ReportPeriodicSCell-r15 CQI-ReportPeriodicSCell-r15 OPTIONAL, -- Need ON

altCQI-Table-1024QAM-r15 ENUMERATED {allSubframes, csi-SubframeSet1,

csi-SubframeSet2, spare1} OPTIONAL -- Need OP

}

-- ASN1STOP

| *CQI-ReportConfig* field descriptions |
| --- |
| ***altCQI-Table, altCQI-Table-1024QAM***  Indicates the applicability of the alternative CQI table (i.e. Table 7.2.3-2 and Table 7.2.3-4 in TS 36.213 [23]) for both aperiodic and periodic CSI reporting for the concerned serving cell. Value *allSubframes* means the alternative CQI table applies to all the subframes and CSI processes, if configured, and value *csi-SubframeSet1* means the alternative CQI table applies to CSI subframe set1, and value *csi-SubframeSet2* means the alternative CQI table applies to CSI subframe set2. EUTRAN sets the value to *csi-SubframeSet1* or *csi-SubframeSet2* only if *transmissionMode* is set in range *tm1* to *tm9* and *csi-SubframePatternConfig-r10* is configured for the concerned serving cell and different CQI tables apply to the two CSI subframe sets; otherwise EUTRAN sets the value to *allSubframes*. EUTRAN does not configure *altCQI-Table-r12* in *CQI-ReportConfig-v1250* and *altCQI-Table-1024QAM-r15* in *CQI-ReportConfig-v1530* or in *CQI-ReportConfigSCell-r15* in the same serving cell simultaneously. If *altCQI-Table-r12* and *altCQI-Table-1024QAM-r15* are absent, the UE shall use Table 7.2.3-1 in TS 36.213 [23] for all subframes and CSI processes, if configured. |
| ***cqi-Mask***  Limits CQI/PMI/PTI/RI reports to the on-duration period of the DRX cycle, see TS 36.321 [6]. One value applies for all CSI processes and all serving cells (the associated functionality is common i.e. not performed independently for each cell). |
| ***cqi-ReportAperiodic***  E-UTRAN does not configure *CQI-ReportAperiodic* when transmission mode 10 is configured for all serving cells. E-UTRAN configures *cqi-ReportAperiodic-v1250* only if *cqi-ReportAperiodic-r10* and *csi-MeasSubframeSets-r12* are configured*.* E-UTRAN configures *cqi-ReportAperiodic-v1310* only if *cqi-ReportAperiodic-r10* is configured*.* |
| ***cqi-ReportModeAperiodic***  Parameter: *reporting mode.* Value rm12 corresponds to Mode 1-2, rm20 corresponds to Mode 2-0, rm22 corresponds to Mode 2-2 etc. PUSCH reporting modes are described in TS 36.213 [23], clause 7.2.1. The UE shall ignore *cqi-ReportModeAperiodic-r10* when transmission mode 10 is configured for the serving cell on this carrier frequency. The UE shall ignore *cqi-ReportModeAperiodic-r10* configured for the PCell/ PSCell when the transmission bandwidth of the PCell/PSCell in downlink is 6 resource blocks. |
| ***cqi-ReportPeriodic***  E-UTRAN does not configure *CQI-ReportPeriodic* for sTTI within *CQI-ReportConfig.* |
| ***csi-MeasSubframeSets***  Indicates the two CSI subframe sets. Value 0 means the subframe belongs to CSI subframe set 1 and value 1 means the subframe belongs to CSI subframe set 2. CSI subframe set 1 refers to *CCSI,0* in TS 36.213 [23], clause 7.2, and CSI subframe set 2 refers to *CCSI,1* in TS 36.213 [23], clause 7.2. EUTRAN does not configure *csi-MeasSubframeSet1-r10* and *csi-MeasSubframeSet2-r10* if either *csi-MeasSubframeSets-r12* for PCell or *eimta-MainConfigPCell-r12* is configured. |
| ***csi-MeasSubframeSet1*, *csi-MeasSubframeSet2***  Indicates the CSI measurement subframe sets. *csi-MeasSubframeSet1* refers to *CCSI,0* in TS 36.213 [23], clause 7.2 and *csi-MeasSubframeSet2* refers to *CCSI,1* in TS 36.213 [23], clause 7.2. E-UTRAN only configures the two CSI measurement subframe sets for the PCell. |
| ***nomPDSCH-RS-EPRE-Offset***  Parameter:  *see* TS 36.213 [23], clause 7.2.3. Actual value = field value \* 2 [dB]. |
| ***pmi-RI-Report***  See TS 36.213 [23], clause 7.2. The presence of this field means PMI/RI reporting is configured; otherwise the PMI/RI reporting is not configured. EUTRAN configures this field only when *transmissionMode* is set to *tm8, tm9* or *tm10*. The UE shall ignore *pmi-RI-Report-r9*/ *pmi-RI-Report-r10* when transmission mode 10 is configured for the serving cell on this carrier frequency. |

| Conditional presence | Explanation |
| --- | --- |
| *cqi-Setup* | This field is not present for an Scell except for the PSCell, while it is conditionally present for the PCell and the PSCell according to the following. The field is optional present, need OR, if the *cqi-ReportPeriodic* in the *cqi-ReportConfig* is set to *setup*. If the field *cqi-ReportPeriodic* is present and set to *release*, the field is not present and the UE shall delete any existing value for this field. Otherwise the field is not present. |
| *PMIRI* | The field is optional present, need OR, if *cqi-ReportPeriodic* is included and set to *setup*, or *cqi-ReportModeAperiodic* is included. If the field *cqi-ReportPeriodic* is present and set to *release* and *cqi-ReportModeAperiodic* is absent, the field is not present and the UE shall delete any existing value for this field. Otherwise the field is not present. |
| *PMIRIPCell* | The field is optional present, need OR, if *cqi-ReportPeriodic* is included in the *CQI-ReportConfig-r10* and set to *setup*, or *cqi-ReportAperiodic* is included in the *CQI-ReportConfig-r10* and set to *setup*. If the field *cqi-ReportPeriodic* is present in the *CQI-ReportConfig-r10* and set to *release* and *cqi-ReportAperiodic* is included in the *CQI-ReportConfig-r10* and set to *release*, the field is not present and the UE shall delete any existing value for this field. Otherwise the field is not present. |
| *PMIRISCell* | The field is optional present, need OR, if *cqi-ReportPeriodicSCell* is included and set to *setup*, or *cqi-ReportModeAperiodic-r10* is included in the *CQI-ReportConfigSCell*. If the field *cqi-ReportPeriodicSCell* is present and set to *release* and *cqi-ReportModeAperiodi*c-r10 is absent in the *CQI-ReportConfigSCell*, the field is not present and the UE shall delete any existing value for this field. Otherwise the field is not present. |

#### – *CQI-ReportPeriodic*

The IE *CQI-ReportPeriodic* is used to specify the periodic CQI reporting configuration elements.

*CQI-ReportPeriodic* information elements

-- ASN1START

CQI-ReportPeriodic ::= CHOICE {

release NULL,

setup SEQUENCE {

cqi-PUCCH-ResourceIndex INTEGER (0..1185),

cqi-pmi-ConfigIndex INTEGER (0..1023),

cqi-FormatIndicatorPeriodic CHOICE {

widebandCQI NULL,

subbandCQI SEQUENCE {

k INTEGER (1..4)

}

},

ri-ConfigIndex INTEGER (0..1023) OPTIONAL, -- Need OR

simultaneousAckNackAndCQI BOOLEAN

}

}

CQI-ReportPeriodic-r10 ::= CHOICE {

release NULL,

setup SEQUENCE {

cqi-PUCCH-ResourceIndex-r10 INTEGER (0..1184),

cqi-PUCCH-ResourceIndexP1-r10 INTEGER (0..1184) OPTIONAL, -- Need OR

cqi-pmi-ConfigIndex INTEGER (0..1023),

cqi-FormatIndicatorPeriodic-r10 CHOICE {

widebandCQI-r10 SEQUENCE {

csi-ReportMode-r10 ENUMERATED {submode1, submode2} OPTIONAL -- Need OR

},

subbandCQI-r10 SEQUENCE {

k INTEGER (1..4),

periodicityFactor-r10 ENUMERATED {n2, n4}

}

},

ri-ConfigIndex INTEGER (0..1023) OPTIONAL, -- Need OR

simultaneousAckNackAndCQI BOOLEAN,

cqi-Mask-r9 ENUMERATED {setup} OPTIONAL, -- Need OR

csi-ConfigIndex-r10 CHOICE {

release NULL,

setup SEQUENCE {

cqi-pmi-ConfigIndex2-r10 INTEGER (0..1023),

ri-ConfigIndex2-r10 INTEGER (0..1023) OPTIONAL -- Need OR

}

} OPTIONAL -- Need ON

}

}

CQI-ReportPeriodic-v1130 ::= SEQUENCE {

simultaneousAckNackAndCQI-Format3-r11 ENUMERATED {setup} OPTIONAL, -- Need OR

cqi-ReportPeriodicProcExtToReleaseList-r11 CQI-ReportPeriodicProcExtToReleaseList-r11 OPTIONAL, -- Need ON

cqi-ReportPeriodicProcExtToAddModList-r11 CQI-ReportPeriodicProcExtToAddModList-r11 OPTIONAL -- Need ON

}

CQI-ReportPeriodic-v1310 ::= SEQUENCE {

cri-ReportConfig-r13 CRI-ReportConfig-r13 OPTIONAL, -- Need OR

simultaneousAckNackAndCQI-Format4-Format5-r13 ENUMERATED {setup} OPTIONAL-- Need OR

}

CQI-ReportPeriodic-v1320 ::= SEQUENCE {

periodicityFactorWB-r13 ENUMERATED {n2, n4} OPTIONAL -- Need OR

}

CQI-ReportPeriodicSCell-r15 ::= CHOICE {

release NULL,

setup SEQUENCE {

cqi-pmi-ConfigIndexDormant-r15 INTEGER (0..1023),

ri-ConfigIndexDormant-r15 INTEGER (0..1023) OPTIONAL, -- Need OR

csi-SubframePatternDormant-r15 CHOICE {

release NULL,

setup SEQUENCE {

csi-MeasSubframeSet1-r15 MeasSubframePattern-r10,

csi-MeasSubframeSet2-r15 MeasSubframePattern-r10

}

} OPTIONAL, -- Need ON

cqi-FormatIndicatorDormant-r15 CHOICE {

widebandCQI-r15 SEQUENCE {

csi-ReportMode-r15 ENUMERATED {submode1, submode2} OPTIONAL -- Need OR

},

subbandCQI-r15 SEQUENCE {

k-r15 INTEGER (1..4),

periodicityFactor-r15 ENUMERATED {n2, n4}

}

} OPTIONAL -- Need OR

}

}

CQI-ReportPeriodicProcExtToAddModList-r11 ::= SEQUENCE (SIZE (1..maxCQI-ProcExt-r11)) OF CQI-ReportPeriodicProcExt-r11

CQI-ReportPeriodicProcExtToReleaseList-r11 ::= SEQUENCE (SIZE (1..maxCQI-ProcExt-r11)) OF CQI-ReportPeriodicProcExtId-r11

CQI-ReportPeriodicProcExt-r11 ::= SEQUENCE {

cqi-ReportPeriodicProcExtId-r11 CQI-ReportPeriodicProcExtId-r11,

cqi-pmi-ConfigIndex-r11 INTEGER (0..1023),

cqi-FormatIndicatorPeriodic-r11 CHOICE {

widebandCQI-r11 SEQUENCE {

csi-ReportMode-r11 ENUMERATED {submode1, submode2} OPTIONAL -- Need OR

},

subbandCQI-r11 SEQUENCE {

k INTEGER (1..4),

periodicityFactor-r11 ENUMERATED {n2, n4}

}

},

ri-ConfigIndex-r11 INTEGER (0..1023) OPTIONAL, -- Need OR

csi-ConfigIndex-r11 CHOICE {

release NULL,

setup SEQUENCE {

cqi-pmi-ConfigIndex2-r11 INTEGER (0..1023),

ri-ConfigIndex2-r11 INTEGER (0..1023) OPTIONAL -- Need OR

}

} OPTIONAL, -- Need ON

...,

[[ cri-ReportConfig-r13 CRI-ReportConfig-r13 OPTIONAL -- Need ON

]],

[[ periodicityFactorWB-r13 ENUMERATED {n2, n4} OPTIONAL -- Need ON

]]

}

CQI-ShortConfigSCell-r15 ::= CHOICE {

release NULL,

setup SEQUENCE {

cqi-pmi-ConfigIndexShort-r15 INTEGER (0..1023),

ri-ConfigIndexShort-r15 INTEGER (0..1023) OPTIONAL, -- Need OR

cqi-FormatIndicatorShort-r15 CHOICE {

widebandCQI-Short-r15 SEQUENCE {

csi-ReportModeShort-r15 ENUMERATED {submode1, submode2} OPTIONAL -- Need OR

},

subbandCQI-Short-r15 SEQUENCE {

k-r15 INTEGER (1..4),

periodicityFactor-r15 ENUMERATED {n2, n4}

}

} OPTIONAL -- Need OR

}

}

CRI-ReportConfig-r13 ::= CHOICE {

release NULL,

setup SEQUENCE {

cri-ConfigIndex-r13 CRI-ConfigIndex-r13,

cri-ConfigIndex2-r13 CRI-ConfigIndex-r13 OPTIONAL -- Need OR

}

}

CRI-ConfigIndex-r13 ::= INTEGER (0..1023)

-- ASN1STOP

| *CQI-ReportPeriodic* field descriptions |
| --- |
| ***cqi-FormatIndicatorPeriodic***  Parameter: *PUCCH CQI Feedback Type,* see TS 36.213 [23], table 7.2.2-1. Depending on transmissionMode, reporting mode is implicitly given from the table. |
| ***cqi-Mask***  Limits CQI/PMI/PTI/RI reports to the on-duration period of the DRX cycle, see TS 36.321 [6]. One value applies for all CSI processes and all serving cells (the associated functionality is common i.e. not performed independently for each cell). |
| ***cqi-pmi-ConfigIndex***  Parameter: *CQI/PMI Periodicity and Offset Configuration Index* *ICQI/PMI,* see TS 36.213 [23], tables 7.2.2-1A and 7.2.2-1C. If subframe patterns for CSI (CQI/PMI/PTI/RI) reporting are configured (i.e. *csi-SubframePatternConfig* is configured), the parameter applies to the subframe pattern corresponding to *csi-MeasSubframeSet1* or corresponding to the CSI subframe set 1 indicated by *csi-MeasSubframeSets-r12.* |
| ***cqi-pmi-ConfigIndex2***  Parameter: *CQI/PMI Periodicity and Offset Configuration Index* *ICQI/PMI,* see TS 36.213 [23], tables 7.2.2-1A and 7.2.2-1C. The parameter applies to the subframe pattern corresponding to *csi-MeasSubframeSet2* or corresponding to the CSI subframe set 2 indicated by *csi-MeasSubframeSets-r12.* |
| ***cqi-PUCCH-ResourceIndex, cqi-PUCCH-ResourceIndexP1***  Parameter for antenna port P0 and for antenna port P1 respectively, see TS 36.213 [23], clause 7.2. E-UTRAN does not apply value 1185. One value applies for all CSI processes. |
| ***cqi-ReportAperiodic***  E-UTRAN does not configure *CQI-ReportAperiodic* when transmission mode 10 is configured for all serving cells. E-UTRAN configures *cqi-ReportAperiodic-v1250* only if *cqi-ReportAperiodic-r10* and *csi-MeasSubframeSets-r12* are configured*.* E-UTRAN configures *cqi-ReportAperiodic-v1310* only if *cqi-ReportAperiodic-r10* is configured*.* |
| ***cqi-ReportModeAperiodic***  Parameter: *reporting mode.* Value rm12 corresponds to Mode 1-2, rm20 corresponds to Mode 2-0, rm22 corresponds to Mode 2-2 etc. PUSCH reporting modes are described in TS 36.213 [23], clause 7.2.1. The UE shall ignore *cqi-ReportModeAperiodic-r10* when transmission mode 10 is configured for the serving cell on this carrier frequency. The UE shall ignore *cqi-ReportModeAperiodic-r10* configured for the PCell/ PSCell when the transmission bandwidth of the PCell/PSCell in downlink is 6 resource blocks. |
| ***CQI-ReportPeriodicProcExt***  A set of periodic CQI related parameters for which E-UTRAN may configure different values for each CSI process. For a serving frequency E-UTRAN configures one or more *CQI-ReportPeriodicProcExt* only when transmission mode 10 is configured for the serving cell on this carrier frequency. |
| ***cri-ConfigIndex***  Parameter: *cri-ConfigIndex ICRI*see TS 36.213 [23]. The parameter applies to the subframe pattern corresponding to *csi-MeasSubframeSet1*. EUTRAN configures the field if subframe patterns for CSI (CQI/PMI/PTI/RI/CRI) reporting are configured (i.e. *csi-SubframePatternConfig* is configured). |
| ***cri-ConfigIndex2***  Parameter: *cri-ConfigIndex ICRI*see TS 36.213 [23]. The parameter applies to the subframe pattern corresponding to *csi-MeasSubframeSet2* or corresponding to the CSI subframe set 2 indicated by *csi-MeasSubframeSets*. E-UTRAN configures *cri-ConfigIndex2* only if *cri-ConfigIndex* is configured. |
| ***cri-ReportConfig***  E-UTRAN configures the field only if the UE is configured with *eMIMO-Ty*pe set to "*beamformed*" and if multiple references to RS configuration using non-zero power transmission are configured (i.e. if *csi-RS-ConfigNZPIdListExt* is configured). |
| ***csi-ConfigIndex***  E-UTRAN configures *csi-ConfigIndex* only for PCell and only if *csi-SubframePatternConfig* is configured. The UE shall release *csi-ConfigIndex* if *csi-SubframePatternConfig* is released. |
| ***csi-ProcessToAddModList***  For a serving frequency E-UTRAN configures one or more *CSI-Process* only when transmission mode 10 is configured for the serving cell on this carrier frequency. |
| ***csi-ReportMode***  Parameter: *PUCCH\_format1-1\_CSI\_reporting\_mode,* see TS 36.213 [23], clause 7.2.2. |
| ***K***  Parameter: K*,* see TS 36.213 [23], clause 7.2.2. |
| ***nomPDSCH-RS-EPRE-Offset***  Parameter:  *see* TS 36.213 [23], clause 7.2.3. Actual value = field value \* 2 [dB]. |
| ***periodicityFactor, periodicityFactorWB***  Parameter: *,* see TS 36.213 [23], clause 7.2.2. EUTRAN configures field *periodicityFactorWB* only when the UE is configured with *eMIMO-Type* set to *nonPrecoded* and with *cqi-FormatIndicatorPeriodic* set to *widebandCQI*. |
| ***ri-ConfigIndex***  Parameter: *RI Config Index* *IRI,* see TS 36.213 [23], clause 7.2.2-1B. If subframe patterns for CSI (CQI/PMI/PTI/RI/CRI) reporting are configured (i.e. *csi-SubframePatternConfig* is configured), the parameter applies to the subframe pattern corresponding to *csi-MeasSubframeSet1.* |
| ***ri-ConfigIndex2***  Parameter: *RI Config Index* *IRI,* see TS 36.213 [23], clause 7.2.2-1B. The parameter applies to the subframe pattern corresponding to *csi-MeasSubframeSet2* or corresponding to the CSI subframe set 2 indicated by *csi-MeasSubframeSets-r12.* E-UTRAN configures *ri-ConfigIndex2* only if *ri-ConfigIndex* is configured. |
| ***simultaneousAckNackAndCQI***  Parameter: *Simultaneous-AN-and-CQI*, see TS 36.213 [23], clause 10.1. TRUE indicates that simultaneous transmission of ACK/NACK and CQI is allowed. One value applies for all CSI processes. For SCells except for the PSCell and PUCCH SCell this field is not applicable and the UE shall ignore the value. |
| ***simultaneousAckNackAndCQI-Format3***  Indicates that the UE shall perform simultaneous transmission of HARQ A/N and periodic CQI report multiplexing on PUCCH format 3, see TS 36.213 [23], clauses 7.2 and 10.1.1. E-UTRAN configures this information only when *pucch-Format* is set to *format3*. One value applies for all CSI processes. For SCells except for the PSCell and PUCCH SCell this field is not applicable and the UE shall ignore the value. |
| ***simultaneousAckNackAndCQI-Format4-Format5***  Indicates that the UE shall perform simultaneous transmission of HARQ A/N and periodic CSI report multiplexing on PUCCH format 4 and format 5, see TS 36.213 [23], clause 10.1.1. E-UTRAN configures this information only when *pucch-Format* is set to *format4* or *format5.* One value applies for all CSI processes. For SCells except for the PSCell and PUCCH SCell this field is not applicable and the UE shall ignore the value. |

#### – *CQI-ReportPeriodicProcExtId*

The IE *CQI-ReportPeriodicProcExtId* is used to identify a periodic CQI reporting configuration that E-UTRAN may configure in addition to the configuration specified by the IE *CQI-ReportPeriodic-r10*. These additional configurations are specified by the IE *CQI-ReportPeriodicProcExt-r11*. The identity is unique within the scope of a carrier frequency.

*CQI-ReportPeriodicProcExtId* information elements

-- ASN1START

CQI-ReportPeriodicProcExtId-r11 ::= INTEGER (1..maxCQI-ProcExt-r11)

-- ASN1STOP

#### – *CrossCarrierSchedulingConfig*

The IE *CrossCarrierSchedulingConfig* is used to specify the configuration when the cross carrier scheduling is used in a cell.

*CrossCarrierSchedulingConfig* information elements

-- ASN1START

CrossCarrierSchedulingConfig-r10 ::= SEQUENCE {

schedulingCellInfo-r10 CHOICE {

own-r10 SEQUENCE { -- No cross carrier scheduling

cif-Presence-r10 BOOLEAN

},

other-r10 SEQUENCE { -- Cross carrier scheduling

schedulingCellId-r10 ServCellIndex-r10,

pdsch-Start-r10 INTEGER (1..4)

}

}

}

CrossCarrierSchedulingConfig-r13 ::= SEQUENCE {

schedulingCellInfo-r13 CHOICE {

own-r13 SEQUENCE { -- No cross carrier scheduling

cif-Presence-r13 BOOLEAN

},

other-r13 SEQUENCE { -- Cross carrier scheduling

schedulingCellId-r13 ServCellIndex-r13,

pdsch-Start-r13 INTEGER (1..4),

cif-InSchedulingCell-r13 INTEGER (1..7)

}

}

}

CrossCarrierSchedulingConfigLAA-UL-r14 ::= SEQUENCE {

schedulingCellId-r14 ServCellIndex-r13,

cif-InSchedulingCell-r14 INTEGER (1..7)

}

-- ASN1STOP

| *CrossCarrierSchedulingConfig* field descriptions |
| --- |
| ***cif-Presence***  The field is used to indicate whether carrier indicator field is present (value TRUE) or not (value FALSE) in PDCCH/ EPDCCH DCI formats, see TS 36.212 [22], clause 5.3.3.1. |
| ***cif-InSchedulingCell***  The field indicates the CIF value used in the scheduling cell to indicate this cell, see TS 36.212 [22], clause 5.3.3.1. In case of carrier indicator field is present, the CIF value is 0. |
| ***pdsch-Start***  The starting OFDM symbol of PDSCH for the concerned SCell, see TS 36.213 [23]. clause 7.1.6.4. Values 1, 2, 3 are applicable when *dl-Bandwidth* for the concerned SCell is greater than 10 resource blocks, values 2, 3, 4 are applicable when *dl-Bandwidth* for the concerned SCell is less than or equal to 10 resource blocks, see TS 36.211 [21], Tables 6 and 7-1. |
| ***schedulingCellId***  Indicates which cell signals the downlink allocations and uplink grants, if applicable, for the concerned SCell. In case the UE is configured with DC, the scheduling cell is part of the same cell group (i.e. MCG or SCG) as the scheduled cell. In case the UE is configured with *crossCarrierSchedulingConfigLAA-UL*, *schedulingCellId* indicated in *crossCarrierSchedulingConfigLAA-UL* only indicates which cell signals the uplink grants. |

#### – *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 or 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. |

#### – *CSI-IM-Config*

The IE *CSI-IM-Config* is the CSI Interference Measurement (IM) configuration that E-UTRAN may configure on a serving frequency, see TS 36.213 [23], clause 7.2.6.

*CSI-IM-Config* information elements

-- ASN1START

CSI-IM-Config-r11 ::= SEQUENCE {

csi-IM-ConfigId-r11 CSI-IM-ConfigId-r11,

resourceConfig-r11 INTEGER (0..31),

subframeConfig-r11 INTEGER (0..154),

...,

[[ interferenceMeasRestriction-r13 BOOLEAN OPTIONAL -- Need ON

]]

}

CSI-IM-ConfigExt-r12 ::= SEQUENCE {

csi-IM-ConfigId-v1250 CSI-IM-ConfigId-v1250,

resourceConfig-r12 INTEGER (0..31),

subframeConfig-r12 INTEGER (0..154),

...,

[[ interferenceMeasRestriction-r13 BOOLEAN OPTIONAL, -- Need ON

csi-IM-ConfigId-v1310 CSI-IM-ConfigId-v1310 OPTIONAL -- Need ON

]]

}

-- ASN1STOP

| *CSI-IM-Config* field descriptions |
| --- |
| ***resourceConfig***  Parameter: CSI reference signal configuration, see TS 36.213 [23], clause 7.2.6 and TS 36.211 [21], tables 6.10.5.2-1 and 6.10.5.2-2 for 4 REs. |
| ***subframeConfig***  Parameter: , see TS 36.213 [23], clause 7.2.6 and TS 36.211 [21], table 6.10.5.3-1. |

#### – *CSI-IM-ConfigId*

The IE *CSI-IM-ConfigId* is used to identify a CSI-IM configuration that is configured by the IE *CSI-IM-Config*. The identity is unique within the scope of a carrier frequency.

*CSI-IM-ConfigId* information elements

-- ASN1START

CSI-IM-ConfigId-r11 ::= INTEGER (1..maxCSI-IM-r11)

CSI-IM-ConfigId-r12 ::= INTEGER (1..maxCSI-IM-r12)

CSI-IM-ConfigId-v1250 ::= INTEGER (maxCSI-IM-r12)

CSI-IM-ConfigId-v1310 ::= INTEGER (minCSI-IM-r13..maxCSI-IM-r13)

CSI-IM-ConfigId-r13 ::= INTEGER (1..maxCSI-IM-r13)

-- ASN1STOP

#### – *CSI-Process*

The IE *CSI-Process* is the CSI process configuration that E-UTRAN may configure on a serving frequency.

*CSI-Process* information elements

-- ASN1START

CSI-Process-r11 ::= SEQUENCE {

csi-ProcessId-r11 CSI-ProcessId-r11,

csi-RS-ConfigNZPId-r11 CSI-RS-ConfigNZPId-r11,

csi-IM-ConfigId-r11 CSI-IM-ConfigId-r11,

p-C-AndCBSRList-r11 P-C-AndCBSR-Pair-r13a,

cqi-ReportBothProc-r11 CQI-ReportBothProc-r11 OPTIONAL, -- Need OR

cqi-ReportPeriodicProcId-r11 INTEGER (0..maxCQI-ProcExt-r11) OPTIONAL, -- Need OR

cqi-ReportAperiodicProc-r11 CQI-ReportAperiodicProc-r11 OPTIONAL, -- Need OR

...,

[[ alternativeCodebookEnabledFor4TXProc-r12 ENUMERATED {true} OPTIONAL, -- Need ON

csi-IM-ConfigIdList-r12 CHOICE {

release NULL,

setup SEQUENCE (SIZE (1..2)) OF CSI-IM-ConfigId-r12

} OPTIONAL, -- Need ON

cqi-ReportAperiodicProc2-r12 CHOICE {

release NULL,

setup CQI-ReportAperiodicProc-r11

} OPTIONAL -- Need ON

]],

[[ cqi-ReportAperiodicProc-v1310 CHOICE {

release NULL,

setup CQI-ReportAperiodicProc-v1310

} OPTIONAL, -- Need ON

cqi-ReportAperiodicProc2-v1310 CHOICE {

release NULL,

setup CQI-ReportAperiodicProc-v1310

} OPTIONAL, -- Need ON

eMIMO-Type-r13 CSI-RS-ConfigEMIMO-r13 OPTIONAL -- Need ON

]],

[[ dummy CSI-RS-ConfigEMIMO-v1430 OPTIONAL, -- Need ON

eMIMO-Hybrid-r14 CSI-RS-ConfigEMIMO-Hybrid-r14 OPTIONAL, -- Need ON

advancedCodebookEnabled-r14 BOOLEAN OPTIONAL -- Need ON

]],

[[ eMIMO-Type-v1480 CSI-RS-ConfigEMIMO-v1480 OPTIONAL -- Need ON

]],

[[ feCOMP-CSI-Enabled-v1530 BOOLEAN OPTIONAL, -- Need ON

eMIMO-Type-v1530 CSI-RS-ConfigEMIMO-v1530 OPTIONAL -- Need ON

]]

}

-- ASN1STOP

| *CSI-Process* field descriptions |
| --- |
| ***advancedCodebookEnabled***  Value TRUE indicates that the UE should use the advanced code book defined in TS 36.213 [23]. EUTRAN does not configure the field when the UE is configured with *eMIMO-Type* is set to *beamformed*, when the UE is configured with *eMIMO-Hybrid* or when the UE is configured with *semiOpenLoop*. |
| ***alternativeCodebookEnabledFor4TXProc***  Indicates whether code book in TS 36.213 [23] Table 7.2.4-0A to Table 7.2.4-0D is being used for deriving CSI feedback and reporting for a CSI process. EUTRAN may configure the field only if the number of CSI-RS ports for non-zero power transmission CSI-RS configuration is 4. |
| ***cqi-ReportAperiodicProc***  If *csi-MeasSubframeSets-r12* is configured for the same frequency as the CSI process, *cqi-ReportAperiodicProc*  applies for CSI subframe set 1. If *csi-MeasSubframeSet1-r10* or *csi-MeasSubframeSet2-r10* are configured for the same frequency as the CSI process, *cqi-ReportAperiodicProc* applies for CSI subframe set 1 or CSI subframe set 2. Otherwise, *cqi-ReportAperiodicProc* applies for all subframes. E-UTRAN configures *cqi-ReportAperiodicProc-v1310* only if *cqi-ReportAperiodicProc-r11* is configured |
| ***cqi-ReportAperiodicProc2***  *cqi-ReportAperiodicProc2* is configured only if *csi-MeasSubframeSets-r12* is configured for the same frequency as the CSI process. *cqi-ReportAperiodicProc2* is for CSI subframe set 2. E-UTRAN shall set *cqi-ReportModeAperiodic-r11* in *cqi-ReportAperiodicProc2* the same as in *cqi-ReportAperiodicProc*. E-UTRAN configures *cqi-ReportAperiodicProc2-v1310* only if *cqi-ReportAperiodicProc2-r12* is configured*.* |
| ***cqi-ReportBothProc***  Includes CQI configuration parameters applicable for both aperiodic and periodic CSI reporting, for which CSI process specific values may be configured. E-UTRAN configures the field if and only if *cqi-ReportPeriodicProcId* is included and/ or if *cqi-ReportAperiodicProc* is included*.* |
| ***cqi-ReportPeriodicProcId***  Refers to a periodic CQI reporting configuration that is configured for the same frequency as the CSI process. Value 0 refers to the set of parameters defined by the REL-10 CQI reporting configuration fields, while the other values refer to the additional configurations E-UTRAN assigns by *CQI-ReportPeriodicProcExt-r11* (and as covered by *CQI-ReportPeriodicProcExtId*). |
| ***csi-IM-ConfigId***  Refers to a CSI-IM configuration that is configured for the same frequency as the CSI process. If *csi-IM-ConfigId-v1250* or *csi-IM-ConfigId-v1310* is configured, the UE only considers this extension (i.e., UE ignores *csi-IM-ConfigId-r11* and *csi-IM-ConfigId-r12*). |
| ***csi-IM-ConfigIdList***  Refers to one or two CSI-IM configurations that are configured for the same frequency as the CSI process. *csi-IM-ConfigIdList* can include 2 entries only if *csi-MeasSubframeSets-r12* is configured for the same frequency as the CSI process. |
| ***csi-RS-ConfigNZPId***  Refers to a CSI RS configuration using non-zero power transmission that is configured for the same frequency as the CSI process. |
| ***dummy***  This field is not used in the specification. If received it shall be ignored by the UE. |
| ***eMIMO-Type***  Parameter: *eMIMO-Type*, see TS 36.213 [23], TS 36.211 [21]. If *eMIMO-Type* is set to *nonPrecoded*, the codebooks used for deriving CSI feedback are in TS 36.213 [23], Table 7.2.4-10 to Table 7.2.4-17. Choice values *nonPrecoded* and *beamformed* correspond to '*CLASS A*' and '*CLASS B*' respectively, see TS 36.212 [22] and TS 36.213 [23]. |
| ***feCOMP-CSI-Enabled***  Parameter: *FeCoMPCSIEnabled*, see TS 36.213 [23], clause 7.1.10. Refers to CSI feedback based on FeCoMP. E-UTRAN only configures the field when the UE is configured with *eMIMO-Type-r13* set to *beamformed* with two *NZP CSI-RS* resources using the IE *CSI-RS-ConfigBeamformed-r13* which contains the two NZP CSI-RS reources configued with *csi-RS-ConfigNZPIdListExt-r13*. |
| ***p-C-AndCBSRList***  The UE shall ignore *p-C-AndCBSRList-r11* if configured with *eMIMO-Type* unless it is set to *beamformed*, *alternativeCodebookEnabledBeamformed* (in *CSI-RS-ConfigBeamformed*) is set to *FALSE* and *csi-RS-ConfigNZPIdListExt* is not configured, |

#### – *CSI-ProcessId*

The IE *CSI-ProcessId* is used to identify a CSI process that is configured by the IE *CSI-Process*. The identity is unique within the scope of a carrier frequency.

*CSI-ProcessId* information elements

-- ASN1START

CSI-ProcessId-r11 ::= INTEGER (1..maxCSI-Proc-r11)

-- ASN1STOP

#### – *CSI-RS-Config*

The IE *CSI-RS-Config* is used to specify the CSI (Channel-State Information) reference signal configuration.

*CSI-RS-Config* information elements

-- ASN1START

CSI-RS-Config-r10 ::= SEQUENCE {

csi-RS-r10 CHOICE {

release NULL,

setup SEQUENCE {

antennaPortsCount-r10 ENUMERATED {an1, an2, an4, an8},

resourceConfig-r10 INTEGER (0..31),

subframeConfig-r10 INTEGER (0..154),

p-C-r10 INTEGER (-8..15)

}

} OPTIONAL, -- Need ON

zeroTxPowerCSI-RS-r10 ZeroTxPowerCSI-RS-Conf-r12 OPTIONAL -- Need ON

}

CSI-RS-Config-v1250 ::= SEQUENCE {

zeroTxPowerCSI-RS2-r12 ZeroTxPowerCSI-RS-Conf-r12 OPTIONAL, -- Need ON

ds-ZeroTxPowerCSI-RS-r12 CHOICE {

release NULL,

setup SEQUENCE {

zeroTxPowerCSI-RS-List-r12 SEQUENCE (SIZE (1..maxDS-ZTP-CSI-RS-r12)) OF ZeroTxPowerCSI-RS-r12

}

} OPTIONAL -- Need ON

}

CSI-RS-Config-v1310 ::= SEQUENCE {

eMIMO-Type-r13 CSI-RS-ConfigEMIMO-r13 OPTIONAL -- Need ON

}

CSI-RS-Config-v1430 ::= SEQUENCE {

dummy CSI-RS-ConfigEMIMO-v1430 OPTIONAL, -- Need ON

eMIMO-Hybrid-r14 CSI-RS-ConfigEMIMO-Hybrid-r14 OPTIONAL, -- Need ON

advancedCodebookEnabled-r14 BOOLEAN OPTIONAL -- Need ON

}

CSI-RS-Config-v1480 ::= SEQUENCE {

eMIMO-Type-v1480 CSI-RS-ConfigEMIMO-v1480 OPTIONAL -- Need ON

}

CSI-RS-Config-v1530 ::= SEQUENCE {

eMIMO-Type-v1530 CSI-RS-ConfigEMIMO-v1530 OPTIONAL -- Need ON

}

CSI-RS-Config-r15 ::= CHOICE {

release NULL,

setup SEQUENCE {

csi-RS-Config-r10 CSI-RS-Config-r10 OPTIONAL, -- Need ON

csi-RS-Config-v1250 CSI-RS-Config-v1250 OPTIONAL, -- Need ON

csi-RS-Config-v1310 CSI-RS-Config-v1310 OPTIONAL, -- Need ON

csi-RS-Config-v1430 CSI-RS-Config-v1430 OPTIONAL -- Need ON

}

}

ZeroTxPowerCSI-RS-Conf-r12 ::= CHOICE {

release NULL,

setup ZeroTxPowerCSI-RS-r12

}

ZeroTxPowerCSI-RS-r12 ::= SEQUENCE {

zeroTxPowerResourceConfigList-r12 BIT STRING (SIZE (16)),

zeroTxPowerSubframeConfig-r12 INTEGER (0..154)

}

-- ASN1STOP

| *CSI-RS-Config* field descriptions |
| --- |
| ***advancedCodebookEnabled***  Value TRUE indicates that the UE should use the advanced code book defined in TS 36.213 [23]. EUTRAN does not configure the field when the UE is configured with *eMIMO-Type* is set to *beamformed*, when the UE is configured with *eMIMO-Hybrid* or when the UE is configured with *semiOpenLoop*. |
| ***antennaPortsCount***  Parameter represents the number of antenna ports used for transmission of CSI reference signals where value an1 corresponds to 1 antenna port, an2 to 2 antenna ports and so on, see TS 36.211 [21], clause 6.10.5. |
| ***ds-ZeroTxPowerCSI-RS***  Parameter for additional *zeroTxPowerCSI-RS* for a serving cell, concerning the CSI-RS included in discovery signals. |
| ***dummy***  This field is not used in the specification. If received it shall be ignored by the UE. |
| ***eMIMO-Type***  Parameter: *eMIMO-Type*, see TS 36.213 [23], TS 36.211 [21]. If *eMIMO-Type* is set to *nonPrecoded*, the codebooks used for deriving CSI feedback are in TS 36.213 [23], Table 7.2.4-10 to Table 7.2.4-17. Choice values *nonPrecoded* and *beamformed* correspond to '*CLASS A*' and '*CLASS B*' respectively, see TS 36.212 [22] and TS 36.213 [23]. |
| ***p-C***  Parameter: , see TS 36.213 [23], clause 7.2.5. The UE shall ignore *p-C-r10* if configured with *eMIMO-Type* unless it is set to *beamformed*, *alternativeCodebookEnabledBeamformed* (in *CSI-RS-ConfigBeamformed*) is set to *FALSE* and *csi-RS-ConfigNZPIdListExt* is not configured. |
| ***resourceConfig***  Parameter: CSI reference signal configuration, see TS 36.211 [21], tables 6.10.5.2-1 and 6.10.5.2-2. |
| ***subframeConfig***  Parameter: , see TS 36.211 [21], table 6.10.5.3-1. |
| ***zeroTxPowerCSI-RS2***  Parameter for additional *zeroTxPowerCSI-RS* for a serving cell. E-UTRAN configures the field only if *csi-MeasSubframeSets-r12* and *TM 1 – 9* are configured for the serving cell. |
| ***zeroTxPowerResourceConfigList***  Parameter: *ZeroPowerCSI-RS,* see TS 36.213 [23], clause 7.2.7. |
| ***zeroTxPowerSubframeConfig***  Parameter: , see TS 36.211 [21], table 6.10.5.3-1. |

#### – *CSI-RS-ConfigBeamformed*

The IE *CSI-RS-ConfigBeamformed* is used to specify the beamforming configuration of EBF/ FD-MIMO.

*CSI-RS-ConfigBeamformed* information elements

-- ASN1START

CSI-RS-ConfigBeamformed-r13 ::= SEQUENCE {

csi-RS-ConfigNZPIdListExt-r13 SEQUENCE (SIZE (1..7)) OF CSI-RS-ConfigNZPId-r13 OPTIONAL, -- Need OR

csi-IM-ConfigIdList-r13 SEQUENCE (SIZE (1..8)) OF CSI-IM-ConfigId-r13 OPTIONAL, -- Need OR

p-C-AndCBSR-PerResourceConfigList-r13 SEQUENCE (SIZE (1..8)) OF P-C-AndCBSR-Pair-r13 OPTIONAL, -- Need OR

ace-For4Tx-PerResourceConfigList-r13 SEQUENCE (SIZE (1..7)) OF BOOLEAN OPTIONAL, -- Need OR

alternativeCodebookEnabledBeamformed-r13 ENUMERATED {true} OPTIONAL, -- Need OR

channelMeasRestriction-r13 ENUMERATED {on} OPTIONAL -- Need OR

}

CSI-RS-ConfigBeamformed-r14 ::= SEQUENCE {

csi-RS-ConfigNZPIdListExt-r14 SEQUENCE (SIZE (1..7)) OF CSI-RS-ConfigNZPId-r13 OPTIONAL, -- Need OR

csi-IM-ConfigIdList-r14 SEQUENCE (SIZE (1..8)) OF CSI-IM-ConfigId-r13 OPTIONAL, -- Need OR

p-C-AndCBSR-PerResourceConfigList-r14 SEQUENCE (SIZE (1..8)) OF P-C-AndCBSR-Pair-r13 OPTIONAL, -- Need OR

ace-For4Tx-PerResourceConfigList-r14 SEQUENCE (SIZE (1..7)) OF BOOLEAN OPTIONAL, -- Need OR

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

channelMeasRestriction-r14 ENUMERATED {on} OPTIONAL, -- Need OR

csi-RS-ConfigNZP-ApList-r14 SEQUENCE (SIZE (1..8)) OF CSI-RS-ConfigNZP-r11

OPTIONAL, -- Need OR

nzp-ResourceConfigOriginal-v1430 CSI-RS-Config-NZP-v1430 OPTIONAL, -- Need OR

csi-RS-NZP-Activation-r14 CSI-RS-ConfigNZP-Activation-r14 OPTIONAL -- Need OR

}

CSI-RS-ConfigBeamformed-v1430::= SEQUENCE {

csi-RS-ConfigNZP-ApList-r14 SEQUENCE (SIZE (1..8)) OF CSI-RS-ConfigNZP-r11

OPTIONAL, -- Need OR

nzp-ResourceConfigOriginal-v1430 CSI-RS-Config-NZP-v1430 OPTIONAL, -- Need OR

csi-RS-NZP-Activation-r14 CSI-RS-ConfigNZP-Activation-r14 OPTIONAL -- Need OR

}

CSI-RS-Config-NZP-v1430::= SEQUENCE {

transmissionComb-r14 NZP-TransmissionComb-r14 OPTIONAL, -- Need OR

frequencyDensity-r14 NZP-FrequencyDensity-r14 OPTIONAL -- Need OR

}

CSI-RS-ConfigNZP-Activation-r14::= SEQUENCE {

csi-RS-NZP-mode-r14 ENUMERATED {semiPersistent, aperiodic},

activatedResources-r14 INTEGER (0..4)

}

-- ASN1STOP

| *CSI-RS-ConfigBeamformed* field descriptions |
| --- |
| ***ace-For4Tx-PerResourceConfigList***  The field indicates the *alternativeCodeBookEnabledFor4TX-r12* per CSI-RS resource. E-UTRAN configures the field only if *csi-RS-ConfigNZPIdListExt* is configured. |
| ***activatedResources***  The number of activated CSI-RS resources, which concerns a subset of the aperiodic CSI-RS resources (for both semi-persistent and aperiodic mode). E-UTRAN configures at most the minimum between *nMaxResource* as configured by *MIMO-UE-ParametersPerTM-r1430* and the number of resources as configured by *csi-RS-ConfigNZP-ApList-r14*. |
| ***alternativeCodebookEnabledBeamformed***  The field indicates whether code book in TS 36.213 [23], Table 7.2.4-18 to Table 7.2.4-20, is being used for deriving CSI feedback and reporting for a CSI process. E-UTRAN configures the field only for a process referring to a single RS configuration using non-zero power transmission (i.e a process for which *csi-RS-ConfigNZPIdListExt* is not configured). Field *alternativeCodebookEnabledBeamformed* corresponds to parameter alternativeCodebookEnabledCLASSB\_K1 in TS 36.212 [22] and TS 36.213 [23]. |
| ***csi-IM-ConfigIdList***  E-UTRAN configures the field *csi-IM-ConfigIdList* only if the IE is included in CSI-Process is configured (i.e. when TM10 is configured for the serving cell). |
| ***CSI-RS-ConfigBeamformed***  If *csi-RS-ConfigNZPIdListExt-r13* is configured, E-UTRAN configures the same total number of entries for NZP, *csi-IM-ConfigIdList-r13* and *p-C-AndCBSR-PerResourceConfigList-r13*. |
| ***csi-RS-ConfigNZP-ApList***  The field is used to configure NZP configurations for aperiodic or semi-persistent CSI RS reporting for which MAC controls activation. EUTRAN configures this field only when the UE is configured to use 2, 4 or and 8 ports CSI-RS, in which case EUTRAN configures the number of entries to be the same as the number of NZP resource configurations. For all these entries the UE shall ignore field *subframeConfig*. EUTRAN always configures this field together with *csi-RS-NZP-Activation*. Furthermore, for a given process, E-UTRAN does not simultaneously configure the periodic NZP configuration(s) and NZP CSI RS configurations for aperiodic or semi-persistent reporting. |
| ***csi-RS-ConfigNZP-EMIMO***  The field is used to configure NZP configurations additional to the one defined by the original NZP configuration as included in *CSI-RS-Config*/ *CSI-Process* when using 12 and 16 ports CSI-RS. |
| ***csi-RS-ConfigNZPIdListExt (in CSI-RS-ConfigBeamformed)***  Indicates the NZP configuration(s)in addition to the original NZP configuration, as defined by *csi-RS-Config-r10* (TM9) or *csi-RS-ConfigNZPId-r11* (TM10). I.e. extends the size of the NZP configuration list (originally a single entry i.e. list of size 1) using the general principles specified in 5.1.2. |
| ***p-C-AndCBSR-PerResourceConfigList***  E-UTRAN does not configure the field *p-C-AndCBSR-PerResourceConfigList* if the UE is configured with *eMIMO-Type* set to *beamformed*, *alternativeCodebookEnabledBeamformed* is set to *FALSE* and *csi-RS-ConfigNZPIdListExt* is not configured. |

#### – *CSI-RS-ConfigEMIMO*

The IE *CSI-RS-ConfigEMIMO* is used to specify the CSI (Channel-State Information) reference signal configuration for EBF/ FD-MIMO.

*CSI-RS-ConfigEMIMO* information elements

-- ASN1START

CSI-RS-ConfigEMIMO-r13 ::= CHOICE {

release NULL,

setup CHOICE {

nonPrecoded-r13 CSI-RS-ConfigNonPrecoded-r13,

beamformed-r13 CSI-RS-ConfigBeamformed-r13

}

}

CSI-RS-ConfigEMIMO-v1430 ::= CHOICE {

release NULL,

setup CHOICE {

nonPrecoded-v1430 CSI-RS-ConfigNonPrecoded-v1430,

beamformed-v1430 CSI-RS-ConfigBeamformed-v1430

}

}

CSI-RS-ConfigEMIMO-v1480 ::= CHOICE {

release NULL,

setup CHOICE {

nonPrecoded-v1480 CSI-RS-ConfigNonPrecoded-v1480,

beamformed-v1480 CSI-RS-ConfigBeamformed-v1430

}

}

CSI-RS-ConfigEMIMO-v1530 ::= CHOICE {

release NULL,

setup CHOICE {

nonPrecoded-v1530 CSI-RS-ConfigNonPrecoded-v1530

}

}

CSI-RS-ConfigEMIMO2-r14 ::= CHOICE {

release NULL,

setup CSI-RS-ConfigBeamformed-r14

}

CSI-RS-ConfigEMIMO-Hybrid-r14 ::= CHOICE {

release NULL,

setup SEQUENCE {

periodicityOffsetIndex-r14 INTEGER (0..1023) OPTIONAL, -- Need OR

eMIMO-Type2-r14 CSI-RS-ConfigEMIMO2-r14 OPTIONAL -- Need ON

}

}

-- ASN1STOP

| *CSI-RS-ConfigEMIMO* field descriptions |
| --- |
| ***periodicityOffsetIndex***  This parameter is associated with the first EMIMO configuration of the hybrid eMIMO configuration. |

#### – *CSI-RS-ConfigNonPrecoded*

The IE *CSI-RS-ConfigNonPrecoded* is used to specify the non-precoded EBF/ FD-MIMO configuration.

-- ASN1START

CSI-RS-ConfigNonPrecoded-r13 ::= SEQUENCE {

p-C-AndCBSRList-r13 P-C-AndCBSR-Pair-r13 OPTIONAL, -- Need OR

codebookConfigN1-r13 ENUMERATED {n1, n2, n3, n4, n8},

codebookConfigN2-r13 ENUMERATED {n1, n2, n3, n4, n8},

codebookOverSamplingRateConfig-O1-r13 ENUMERATED {n4, n8} OPTIONAL, -- Need OR

codebookOverSamplingRateConfig-O2-r13 ENUMERATED {n4, n8} OPTIONAL, -- Need OR

codebookConfig-r13 INTEGER (1..4),

csi-IM-ConfigIdList-r13 SEQUENCE (SIZE (1..2)) OF CSI-IM-ConfigId-r13 OPTIONAL, -- Need OR

csi-RS-ConfigNZP-EMIMO-r13 CSI-RS-ConfigNZP-EMIMO-r13 OPTIONAL -- Need ON

}

CSI-RS-ConfigNonPrecoded-v1430::= SEQUENCE {

csi-RS-ConfigNZP-EMIMO-v1430 CSI-RS-ConfigNZP-EMIMO-v1430 OPTIONAL, -- Need ON

codebookConfigN1-v1430 ENUMERATED {n5, n6, n7, n10, n12, n14, n16},

codebookConfigN2-v1430 ENUMERATED {n5, n6, n7},

nzp-ResourceConfigTM9-Original-v1430 CSI-RS-Config-NZP-v1430

}

CSI-RS-ConfigNonPrecoded-v1480::= SEQUENCE {

csi-RS-ConfigNZP-EMIMO-v1480 CSI-RS-ConfigNZP-EMIMO-v1430 OPTIONAL, -- Need ON

codebookConfigN1-v1480 ENUMERATED {n5, n6, n7, n10, n12, n14, n16} OPTIONAL, -- Need OR

codebookConfigN2-r1480 ENUMERATED {n5, n6, n7} OPTIONAL, -- Need OR

nzp-ResourceConfigTM9-Original-v1480 CSI-RS-Config-NZP-v1430

}

CSI-RS-ConfigNonPrecoded-v1530 ::= SEQUENCE {

p-C-AndCBSRList-r15 P-C-AndCBSR-Pair-r15 OPTIONAL -- Need OR

}

-- ASN1STOP

| *CSI-RS-ConfigNonPrecoded* field descriptions |
| --- |
| ***codebookConfig***  Indicates a sub-set of the codebook entry, see TS 36.213 [23]. |
| ***codebookConfigNx***  Indicates the number of antenna ports per polarization in dimension x as used for transmission of CSI reference signals. Value n1 corresponds to 1, value n2 corresponds to 2 and so on, see TS 36.213 [23]. E-UTRAN configures the field in accordance with the restrictions as specified in TS 36.213 [23]. If *codebookConfigNx* in *CSI-RS-ConfigNonPrecoded-v1480* is configured, the UE shall ignore the field *codebookConfigNx* in *CSI-RS-ConfigNonPrecoded-r13*. |
| ***codebookOverSamplingRateConfig-Ox***  Indicates the spatial over-sampling rate in dimension x as used for transmission of CSI reference signals. Value n4 corresponds to 4 and value n8 corresponds to 8, see TS 36.213 [23]. |
| ***csi-IM-ConfigId(List)***  E-UTRAN configures the field *csi-IM-ConfigIdList* only if the IE is included in CSI-Process is configured (i.e. when TM10 is configured for the serving cell). |
| ***csi-RS-ConfigNZP-EMIMO***  The field is used to configure NZP configurations additional to the one defined by the original NZP configuration as included in *CSI-RS-Config*/ *CSI-Process* when using more than 8 ports CSI-RS as defined in TS 36.211 [21], table 6.10.5-1. |

#### – *CSI-RS-ConfigNZP*

The IE *CSI-RS-ConfigNZP* is the CSI-RS resource configuration using non-zero power transmission that E-UTRAN may configure on a serving frequency.

*CSI-RS-ConfigNZP* information elements

-- ASN1START

CSI-RS-ConfigNZP-r11 ::= SEQUENCE {

csi-RS-ConfigNZPId-r11 CSI-RS-ConfigNZPId-r11,

antennaPortsCount-r11 ENUMERATED {an1, an2, an4, an8},

resourceConfig-r11 INTEGER (0..31),

subframeConfig-r11 INTEGER (0..154),

scramblingIdentity-r11 INTEGER (0..503),

qcl-CRS-Info-r11 SEQUENCE {

qcl-ScramblingIdentity-r11 INTEGER (0..503),

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

mbsfn-SubframeConfigList-r11 CHOICE {

release NULL,

setup SEQUENCE {

subframeConfigList MBSFN-SubframeConfigList

}

} OPTIONAL -- Need ON

} OPTIONAL, -- Need OR

...,

[[ csi-RS-ConfigNZPId-v1310 CSI-RS-ConfigNZPId-v1310 OPTIONAL -- Need ON

]],

[[ transmissionComb-r14 NZP-TransmissionComb-r14 OPTIONAL, -- Need OR

frequencyDensity-r14 NZP-FrequencyDensity-r14 OPTIONAL -- Need OR

]],

[[ mbsfn-SubframeConfigList-v1430 CHOICE {

release NULL,

setup SEQUENCE {

subframeConfigList-v1430 MBSFN-SubframeConfigList-v1430

}

} OPTIONAL -- Need OP

]]

}

CSI-RS-ConfigNZP-EMIMO-r13 ::= CHOICE {

release NULL,

setup SEQUENCE {

nzp-resourceConfigList-r13 SEQUENCE (SIZE (1..2)) OF NZP-ResourceConfig-r13,

cdmType-r13 ENUMERATED {cdm2, cdm4} OPTIONAL -- Need OR

}

}

CSI-RS-ConfigNZP-EMIMO-v1430 ::= SEQUENCE {

-- All extensions are for Non-Precoded so could be grouped by setup/ release choice

nzp-resourceConfigListExt-r14 SEQUENCE (SIZE (0..4)) OF NZP-ResourceConfig-r13,

cdmType-v1430 ENUMERATED {cdm8 } OPTIONAL -- Need OR

}

NZP-ResourceConfig-r13 ::= SEQUENCE {

resourceConfig-r13 ResourceConfig-r13,

...,

[[ transmissionComb-r14 NZP-TransmissionComb-r14 OPTIONAL, -- Need OR

frequencyDensity-r14 NZP-FrequencyDensity-r14 OPTIONAL -- Need OR

]]

}

ResourceConfig-r13 ::= INTEGER (0..31)

NZP-TransmissionComb-r14 ::= INTEGER (0..2)

NZP-FrequencyDensity-r14 ::= ENUMERATED {d1, d2, d3}

-- ASN1STOP

| *CSI-RS-ConfigNZP* field descriptions |
| --- |
| ***antennaPortsCount***  Parameter represents the number of antenna ports used for transmission of CSI reference signals where an1 corresponds to 1, an2 to 2 antenna ports etc. see TS 36.211 [21], clause 6.10.5. |
| ***cdmType***  Parameter: *CDMType*, see TS 36.211 [21], clause 6.10.5.2. |
| ***csi-RS-ConfigNZPId***  Refers to a CSI RS configuration using non-zero power transmission that is configured for the same frequency as the CSI process. UE shall ignore *CSI-RS-ConfigNZPId-r11* if *CSI-RS-ConfigNZPId-v1310* is signalled. |
| ***frequencyDensity***  Indicates the freqency-domain density reduction. E-UTRAN configures the values in accordance with the restrictions specified in TS 36.213 [23]. |
| ***mbsfn-SubframeConfigList***  Indicates the MBSFN configuration for the CSI-RS resources. If *qcl-CRS-Info-r11* is absent, the field is released. |
| ***nzp-resourceConfigList***  Indicate a list of non-zero power transmission CSI-RS resources using parameter*resourceConfig.* |
| ***qcl-CRS-Info***  Indicates CRS antenna ports that is quasi co-located with the CSI-RS antenna ports, see TS 36.213 [23], clause 7.2.5. EUTRAN configures this field if and only if the UE is configured with *qcl-Operation* set to *typeB.* |
| ***resourceConfig***  Parameter: CSI reference signal configuration, see TS 36.211 [21], table 6.10.5.2-1 and 6.10.5.2-2. |
| ***subframeConfig***  Parameter: , see TS 36.211 [21], table 6.10.5.3-1. |
| ***scramblingIdentity***  Parameter: Pseudo-random sequence generator parameter, *,* see TS 36.213 [23], clause 7.2.5. |
| ***transmissionComb***  Indicates the transmission combining offset. E-UTRAN configures the values in accordance with the restrictions specified in TS 36.213 [23]. |

#### – *CSI-RS-ConfigNZPId*

The IE *CSI-RS-ConfigNZPId* is used to identify a CSI-RS resource configuration using non-zero transmission power, as configured by the IE *CSI-RS-ConfigNZP*. The identity is unique within the scope of a carrier frequency.

*CSI-RS-ConfigNZPId* information elements

-- ASN1START

CSI-RS-ConfigNZPId-r11 ::= INTEGER (1..maxCSI-RS-NZP-r11)

CSI-RS-ConfigNZPId-v1310 ::= INTEGER (minCSI-RS-NZP-r13..maxCSI-RS-NZP-r13)

CSI-RS-ConfigNZPId-r13 ::= INTEGER (1..maxCSI-RS-NZP-r13)

-- ASN1STOP

#### – *CSI-RS-ConfigZP*

The IE *CSI-RS-ConfigZP* is the CSI-RS resource configuration, for which UE assumes zero transmission power, that E-UTRAN may configure on a serving frequency.

*CSI-RS-ConfigZP* information elements

-- ASN1START

CSI-RS-ConfigZP-r11 ::= SEQUENCE {

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

resourceConfigList-r11 BIT STRING (SIZE (16)),

subframeConfig-r11 INTEGER (0..154),

...

}

CSI-RS-ConfigZP-ApList-r14 ::= CHOICE {

release NULL,

setup SEQUENCE (SIZE (1.. maxCSI-RS-ZP-r11)) OF CSI-RS-ConfigZP-r11

}

-- ASN1STOP

| *CSI-RS-ConfigZP* field descriptions |
| --- |
| ***CSI-RS-ConfigZP-ApList***  Indicates the aperiodic zero power CSI-RS present in a given subframe. See 36.213 [23], Table 7.1.9-2. First entry in the list corresponds to aperiodic trigger 00, second entry in the list corresponds to aperiodic trigger 01 and so on. |
| ***resourceConfigList***  Parameter: *ZeroPowerCSI-RS*, see TS 36.213 [23], clause 7.2.7. |
| ***subframeConfig***  Parameter: , see TS 36.211 [21], table 6.10.5.3-1. |

#### – *CSI-RS-ConfigZPId*

The IE *CSI-RS-ConfigZPId* is used to identify a CSI-RS resource configuration for which UE assumes zero transmission power, as configured by the IE *CSI-RS-ConfigZP*. The identity is unique within the scope of a carrier frequency.

*CSI-RS-ConfigZPId* information elements

-- ASN1START

CSI-RS-ConfigZPId-r11 ::= INTEGER (1..maxCSI-RS-ZP-r11)

-- ASN1STOP

#### – *DataInactivityTimer*

The IE *DataInactivityTimer* is used to control Data inactivity operation. Corresponds to the timer for data inactivity monitoring in TS 36.321 [6]. Value s1 corresponds to 1 second, s2 corresponds to 2 seconds and so on.

*DataInactivityTimer* information element

-- ASN1START

DataInactivityTimer-r14 ::= ENUMERATED {

s1, s2, s3, s5, s7, s10, s15, s20, s40, s50, s60,

s80, s100, s120, s150, s180}

-- ASN1STOP

#### – *DMRS-Config*

The IE *DMRS-Config* is the DMRS configuration that E-UTRAN may configure on a serving frequency.

*DMRS-Config* information elements

-- ASN1START

DMRS-Config-r11 ::= CHOICE {

release NULL,

setup SEQUENCE {

scramblingIdentity-r11 INTEGER (0..503),

scramblingIdentity2-r11 INTEGER (0..503)

}

}

DMRS-Config-v1310 ::= SEQUENCE {

dmrs-tableAlt-r13 ENUMERATED {true} OPTIONAL -- Need OR

}

-- ASN1STOP

| *DMRS-Config* field descriptions |
| --- |
| ***scramblingIdentity, scramblingIdentity2***  Parameter: *,* see TS 36.211 [21], clause 6.10.3.1. |
| ***dmrs-tableAlt***  The field indicates whether to use an alternative table for DMRS upon PDSCH transmission, see TS 36.213 [23]. |

#### – *DRB-Identity*

The IE *DRB-Identity* is used to identify a DRB used by a UE.

*DRB-Identity* information elements

-- ASN1START

DRB-Identity ::= INTEGER (1..32)

-- ASN1STOP

#### – *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: , 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 values 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. |

#### *– EIMTA-MainConfig*

The IE *EIMTA-MainConfig* is used to specify the eIMTA-RNTI used for eIMTA and the subframes used for monitoring PDCCH with eIMTA-RNTI. The IE *EIMTA-MainConfigServCell* is used to specify the eIMTA related parameters applicable for the concerned serving cell.

*EIMTA-MainConfig* information element

-- ASN1START

EIMTA-MainConfig-r12 ::= CHOICE {

release NULL,

setup SEQUENCE {

eimta-RNTI-r12 C-RNTI,

eimta-CommandPeriodicity-r12 ENUMERATED {sf10, sf20, sf40, sf80},

eimta-CommandSubframeSet-r12 BIT STRING (SIZE(10))

}

}

EIMTA-MainConfigServCell-r12 ::= CHOICE {

release NULL,

setup SEQUENCE {

eimta-UL-DL-ConfigIndex-r12 INTEGER (1..5),

eimta-HARQ-ReferenceConfig-r12 ENUMERATED {sa2, sa4, sa5},

mbsfn-SubframeConfigList-v1250 CHOICE {

release NULL,

setup SEQUENCE {

subframeConfigList-r12 MBSFN-SubframeConfigList

}

}

}

}

-- ASN1STOP

| *EIMTA-MainConfig* field descriptions |
| --- |
| ***eimta-CommandPeriodicity***  Configures the periodicity to monitor PDCCH with eIMTA-RNTI, see TS 36.213 [23], clause 13.1. Value sf10 corresponds to 10 subframes, sf20 corresponds to 20 subframes and so on. |
| ***eimta-CommandSubframeSet***  Configures the subframe(s) to monitor PDCCH with eIMTA-RNTI within the periodicity configured by *eimta-CommandPeriodicity*. The 10 bits correspond to all subframes in the last radio frame within each periodicity. The left most bit is for subframe 0 and so on. Each bit can be of value 0 or 1. The value of 1 means that the corresponding subframe is configured for monitoring PDCCH with eIMTA-RNTI, and the value of 0 means otherwise. In case of TDD as PCell, only the downlink and the special subframes indicated by the UL/ DL configuration in SIB1 can be configured for monitoring PDCCH with eIMTA-RNTI. In case of FDD as PCell, any of the ten subframes can be configured for monitoring PDCCH with eIMTA-RNTI. |
| ***eimta-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. |
| ***eimta-UL-DL-ConfigIndex***  Index of *I*, see TS 36.212 [22], clause 5.3.3.1.4. E-UTRAN configures the same value for all serving cells residing on same frequency band. |
| ***mbsfn-SubframeConfigList***  Configure the MBSFN subframes for the UE on this serving cell. An uplink subframe indicated by the DL/UL subframe configuration in SIB1 can be configured as MBSFN subframe. |

#### *– 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 GWUS-GroupNarrowBandList-r16 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 CHOICE {

resourceLocationWithWUS ENUMERATED {primary, secondary, primary3FDM},

resourceLocationWithoutWUS ENUMERATED {n0, n2}

},

numGroupsList-r16 GWUS-NumGroupsList-r16 OPTIONAL, -- Need OP

groupsForServiceList-r16 GWUS-GroupsForServiceList-r16 OPTIONAL -- Cond ProbabilityBased

}

GWUS-GroupsForServiceList-r16 ::= SEQUENCE (SIZE (1..maxGWUS-ProbThresholds-r16)) OF INTEGER (1..maxGWUS-Groups-1-r16)

GWUS-GroupNarrowBandList-r16 ::= SEQUENCE (SIZE (1..maxAvailNarrowBands-r13)) OF BOOLEAN

GWUS-NumGroupsList-r16 ::= SEQUENCE (SIZE (1..maxGWUS-Resources-r16)) OF GWUS-NumGroups-r16

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

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

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 paging narrowbands support group WUS see TS 36.304 [4]. First entry in the list indicates WUS support for first paging narrowband, second entry in the list indicates WUS support for second paging narrowband, and so on. If E-UTRAN includes *groupNarrowBandList*, the number of entries is equal to the value of *paging-narrowBands*. If this list is absent, group WUS is supported on all paging narrowbands.  E-UTRAN does not configure this field when RRC\_INACTIVE is used in the cell. |
| ***groupsForServiceList***  Number of WUS groups for each paging probability group see TS 36.304 [4]. The first entry corresponds to the first probability group, the second entry corresponds to the second paging probability group, and so on. Total number of WUS groups in this list cannot be more than the total number of WUS groups in *numGroupsList*. If E-UTRAN includes *groupsForServiceList*, it includes the same number of entries and listed in the same order as in *probThreshList*. |
| ***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. |
| ***resourceMappingPattern***  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 *resourceLocationWithWUS*; otherwise the field is set to value *resourceLocationWithoutWUS*. |
| ***timeParameters***  Time domain WUS configuration information. For individual field descriptions, see *WUS-Config.* If the field is absent, the parameters in *wus-Config* apply. |

| Conditional presence | Explanation |
| --- | --- |
| *NoWUSr15* | The field is mandatory present if *wus-Config-r15* is not present in *SystemInformationBlockType2*; otherwise the field is not present. |
| *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. |

#### – *LogicalChannelConfig*

The IE *LogicalChannelConfig* is used to configure the logical channel parameters.

*LogicalChannelConfig* information element

-- ASN1START

LogicalChannelConfig ::= SEQUENCE {

ul-SpecificParameters SEQUENCE {

priority INTEGER (1..16),

prioritisedBitRate ENUMERATED {

kBps0, kBps8, kBps16, kBps32, kBps64, kBps128,

kBps256, infinity, kBps512-v1020, kBps1024-v1020,

kBps2048-v1020, spare5, spare4, spare3, spare2,

spare1},

bucketSizeDuration ENUMERATED {

ms50, ms100, ms150, ms300, ms500, ms1000, spare2,

spare1},

logicalChannelGroup INTEGER (0..3) OPTIONAL -- Need OR

} OPTIONAL, -- Cond UL

...,

[[ logicalChannelSR-Mask-r9 ENUMERATED {setup} OPTIONAL -- Cond SRmask

]],

[[ logicalChannelSR-Prohibit-r12 BOOLEAN OPTIONAL -- Need ON

]],

[[ laa-UL-Allowed-r14 BOOLEAN OPTIONAL, -- Need ON

bitRateQueryProhibitTimer-r14 ENUMERATED {

s0, s0dot4, s0dot8, s1dot6, s3, s6, s12,

s30} OPTIONAL --Need OR

]],

[[ allowedTTI-Lengths-r15 CHOICE {

release NULL,

setup SEQUENCE {

shortTTI-r15 BOOLEAN,

subframeTTI-r15 BOOLEAN

}

} OPTIONAL, -- Need ON

logicalChannelSR-Restriction-r15 CHOICE {

release NULL,

setup ENUMERATED {spucch, pucch}

} OPTIONAL, -- Need ON

channelAccessPriority-r15 CHOICE {

release NULL,

setup INTEGER (1..4)

} OPTIONAL, -- Need ON

lch-CellRestriction-r15 BIT STRING (SIZE (maxServCell-r13)) OPTIONAL -- Need ON

]],

[[

bitRateMultiplier-r16 ENUMERATED {x40, x70, x100, x200} OPTIONAL -- Need OR

]]

}

-- ASN1STOP

| *LogicalChannelConfig* field descriptions |
| --- |
| ***allowedTTI-Lengths***  Indicates the allowed TTI lengths for the logical channel. If not configured, the UE is allowed to transmit the logical channel using any TTI length. |
| ***bitRateMultiplier***  Bit rate multiplier for recommended bit rate MAC CE as specified in TS 36.321 [6]. Value *x40* indicates bit rate multiplier 40, value *x70* indicates bit rate multiplier 70 and so on. |
| ***bitRateQueryProhibitTimer***  The timer is used for bit rate recommendation query in TS 36.321 [6], clause 5.18, in seconds. Value s0 means 0s, s0dot4 means 0.4s and so on. |
| ***bucketSizeDuration***  Bucket Size Duration for logical channel prioritization in TS 36.321 [6]. Value in milliseconds. Value ms50 corresponds to 50 ms, ms100 corresponds to 100 ms and so on. |
| ***channelAccessPriority***  Indicates the channel access priority class for the logical channel. UE shall select the lowest channel access priority class (i.e. highest signalled value) of the logical channel with MAC SDU multiplexed into the MAC PDU. MAC CEs except padding BSR apply the highest channel access priority class (i.e. lowest signalled value) , as defined in TS 36.300 [9]. |
| ***laa-UL-Allowed***  Indicates whether the data of a logical channel is allowed to be transmitted via UL of LAA SCells. Value *TRUE* indicates that the logical channel is allowed to be sent via UL of LAA SCells. Value *FALSE* indicates that the logical channel is not allowed to be sent via UL of LAA SCells. |
| ***lch-CellRestriction***  Indicates cells which are restricted for the logical channel, The bit is set to 1 if the cell is restricted and to 0 if the cell is not restricted, for each cell. The least significant bit corresponds to the serving cell with index 0, the next bit corresponds to the serving cell with index 1, and so on. If the cell is restricted for the logical channel, then data for the logical channel is not allowed to be sent using that cell. If the field is not included, no cells are restricted. See also TS 36.321 [6], clause 5.4.3.1. The restriction is only active when PDCP duplication using CA is activated. |
| ***logicalChannelGroup***  Mapping of logical channel to logical channel group for BSR reporting in TS 36.321 [6]. |
| ***logicalChannelSR-Mask***  Controlling SR triggering on a logical channel basis when an uplink grant is configured. See TS 36.321 [6]. |
| ***logicalChannelSR-Prohibit***  Value *TRUE* indicates that the *logicalChannelSR-ProhibitTimer* is enabled for the logical channel. E-UTRAN only (optionally) configures the field (i.e. indicates value *TRUE*) if *logicalChannelSR-ProhibitTimer* is configured. See TS 36.321 [6]. |
| ***logicalChannelSR-Restriction***  Defines the restricted SR configuration for the logical channel. Value spucch indicates that the SR cannot be sent on SPUCCH and value pucch indicates that the SR cannot be sent on PUCCH. If not configured, the UE is allowed to transmit the SR on any SR resource. |
| ***prioritisedBitRate***  Prioritized Bit Rate for logical channel prioritization in TS 36.321 [6]. Value in kilobytes/second. Value kBps0 corresponds to 0 kB/second, kBps8 corresponds to 8 kB/second, kBps16 corresponds to 16 kB/second and so on. Infinity is the only applicable value for SRB1 and SRB2 |
| ***priority***  Logical channel priority in TS 36.321 [6]. Value is an integer. |
| ***shortTTI, subframeTTI***  For short TTIs and subframe TTIs respectively: Value TRUE indicates that the UE is allowed to transmit using this TTI length for the logical channel and the value FALSE indicates that the UE is not allowed to transmit using this TTI length for the logical channel. If not configured for a TTI length, then the UE is allowed to transmit this logical channel using this TTI length. |

| Conditional presence | Explanation |
| --- | --- |
| *SRmask* | The field is optionally present if *ul-SpecificParameters* is present, need OR; otherwise it is not present. |
| *UL* | The field is mandatory present for UL logical channels; otherwise it is not present. |

#### – *LWA-Configuration*

The IE *LWA-Configuration* is used to setup/modify/release LTE-WLAN Aggregation.

-- ASN1START

LWA-Configuration-r13 ::= CHOICE {

release NULL,

setup SEQUENCE {

lwa-Config-r13 LWA-Config-r13

}

}

LWA-Config-r13 ::= SEQUENCE {

lwa-MobilityConfig-r13 WLAN-MobilityConfig-r13 OPTIONAL, -- Need ON

lwa-WT-Counter-r13 INTEGER (0..65535) OPTIONAL, -- Need ON

...,

[[ wt-MAC-Address-r14 OCTET STRING (SIZE (6)) OPTIONAL -- Need ON

]]

}

-- ASN1STOP

| *LWA-Configuration* field descriptions |
| --- |
| ***lwa-MobilityConfig***  Indicates the parameters used for WLAN mobility. |
| ***lwa-WT-Counter***  Indicates the parameter used by UE for WLAN authentication. |
| ***wt-MAC-Address***  Indicates the WT MAC address of the WT handling the LWA operation for the UE. The UE uses this MAC address in uplink transmissions to enable routing of LWA uplink data from the AP to the WT. E-UTRAN configures the field only if *ul-LWA-Config-r14* is configured for at least one LWA bearer. |

#### – *LWIP-Configuration*

The IE *LWIP-Configuration* is used to add, modify or release DRBs that are using LWIP Tunnel.

-- ASN1START

LWIP-Configuration-r13 ::= CHOICE {

release NULL,

setup SEQUENCE {

lwip-Config-r13 LWIP-Config-r13

}

}

LWIP-Config-r13 ::= SEQUENCE {

lwip-MobilityConfig-r13 WLAN-MobilityConfig-r13 OPTIONAL, -- Need ON

tunnelConfigLWIP-r13 TunnelConfigLWIP-r13 OPTIONAL, -- Need ON

...

}

-- ASN1STOP

| *LWIP-Configuration* field descriptions |
| --- |
| ***lwip-MobilityConfig***  Indicates the WLAN mobility set for LWIP. |
| ***tunnelConfigLWIP***  Indicates the parameters used for establishing the LWIP tunnel. |

#### – *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

]],

[[ offsetThresholdTA-r17 SetupRelease {OffsetThresholdTA-r17}

OPTIONAL, -- Need ON

sr-ProhibitTimerOffset-r17 SetupRelease {SR-ProhibitTimerOffset-r17}

OPTIONAL -- Need ON

]]

}

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}

OffsetThresholdTA-r17 ::= ENUMERATED {

ms0dot5, ms1, ms2, ms3, ms4, ms5, ms6 ,ms7,

ms8, ms9, ms10, ms11, ms12, ms13, ms14, ms15}

SR-ProhibitTimerOffset-r17 ::= ENUMERATED {

ms90, ms180, ms270, ms360,

ms450, ms540, ms1080, spare}

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-UTRAN does not configure this field when a DAPS bearer is configured. | |
| ***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. E-UTRAN does not configure this field when a DAPS bearer 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. E-UTRAN does not configure this field when a DAPS bearer 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. |
| ***offsetThresholdTA***  Offset for TA reporting as specified in TS 36.321 [6]. Value *ms0dot5* corresponds to 0.5 millisecond, value *ms1* corresponds to 1 millisecond and so on. | | |
| ***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.  If *sr-ProhibitTimerOffset* is present, actual value of *sr-ProhibitTimer* = CEIL (*sr-ProhibitTimerOffset*/ SR period) + signalled value of *sr-ProhibitTimer*. | |
| ***sr-ProhibitTimerOffset***  Time offset for SR transmission on PUCCH*.* Value in milliseconds. Value *ms90* corresponds to 90 ms, value *ms180* corresponds to 180 ms and so on. | | |
| ***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. | |

#### *– P-C-AndCBSR*

The IE *P-C-AndCBSR* is used to specify the power control and codebook subset restriction configuration.

*P-C-AndCBSR* information elements

-- ASN1START

P-C-AndCBSR-r11 ::= SEQUENCE {

p-C-r11 INTEGER (-8..15),

codebookSubsetRestriction-r11 BIT STRING

}

P-C-AndCBSR-r13 ::= SEQUENCE {

p-C-r13 INTEGER (-8..15),

cbsr-Selection-r13 CHOICE{

nonPrecoded-r13 SEQUENCE {

codebookSubsetRestriction1-r13 BIT STRING,

codebookSubsetRestriction2-r13 BIT STRING

},

beamformedK1a-r13 SEQUENCE {

codebookSubsetRestriction3-r13 BIT STRING

},

beamformedKN-r13 SEQUENCE {

codebookSubsetRestriction-r13 BIT STRING

}

},

...

}

P-C-AndCBSR-r15 ::= SEQUENCE {

p-C-r15 INTEGER (-8..15),

codebookSubsetRestriction4-r15 BIT STRING

}

P-C-AndCBSR-Pair-r13a ::= SEQUENCE (SIZE (1..2)) OF P-C-AndCBSR-r11

P-C-AndCBSR-Pair-r13 ::= SEQUENCE (SIZE (1..2)) OF P-C-AndCBSR-r13

P-C-AndCBSR-Pair-r15 ::= SEQUENCE (SIZE (1..2)) OF P-C-AndCBSR-r15

-- ASN1STOP

| *P-C-AndCBSR* field descriptions |
| --- |
| ***cbsr-Selection***  Indicates which codebook subset restriction parameter(s) are to be used. E-UTRAN applies values *nonPrecoded* when *eMIMO-Type* is set to *nonPrecoded*. E-UTRAN applies value *beamformedK1a* when *eMIMO-Type* is set to *beamformed*, *alternativeCodebookEnabledBeamformed* is set to *TRUE* and *csi-RS-ConfigNZPIdListExt* is not configured. E-UTRAN applies value *beamformedKN* when *csi-RS-ConfigNZPIdListExt* is configured. E-UTRAN applies value *beamformedKN* when *eMIMO-Type* is set to *beamformed*, *csi-RS-ConfigNZPIdListExt* is not configured and *alternativeCodebookEnabledBeamformed* is set to *FALSE*. |
| ***codebookSubsetRestriction***  Parameter: codebookSubsetRestriction, see TS 36.213 [23] and TS 36.211 [21]. The number of bits in the *codebookSubsetRestriction* for applicable transmission modes is defined in TS 36.213 [23]. |
| ***codebookSubsetRestriction1***  Parameter: codebookSubsetRestriction1, see TS 36.213 [23], Table 7.2-1d. The number of bits in the *codebookSubsetRestriction1* for applicable transmission modes is defined in TS 36.213 [23]. |
| ***codebookSubsetRestriction2***  Parameter: codebookSubsetRestriction2, see TS 36.213 [23], Table 7.2-1e. The number of bits in the *codebookSubsetRestriction2* for applicable transmission modes is defined in TS 36.213 [23]. |
| ***codebookSubsetRestriction3***  Parameter: codebookSubsetRestriction3, see TS 36.213 [23], Table 7.2-1f. The UE shall ignore *codebookSubsetRestriction-r11* or *codebookSubsetRestriction-r10* if *codebookSubsetRestriction3-r13* is configured. The number of bits in the *codebookSubsetRestriction3* for applicable transmission modes is defined in TS 36.213 [23]. |
| ***codebookSubsetRestriction4***  Parameter: codebookSubsetRestriction4, see TS 36.213 [23], Table 7.2. The number of bits in the *codebookSubsetRestriction4* for applicable transmission modes is defined in TS 36.213 [23]. |
| ***p-C***  Parameter: , see TS 36.213 [23], clause 7.2.5. |
| ***P-C-AndCBSR-Pair***  E-UTRAN includes a single entry if the UE is configured with TM9. If the UE is configured with TM10 and E-UTRAN includes 2 entries, this indicates that the subframe patterns configured for CSI (CQI/PMI/PTI/RI/CRI) reporting (i.e. as defined by field *csi-MeasSubframeSet1* and *csi-MeasSubframeSet2*, or as defined by *csi-MeasSubframeSets-r12*) are to be used for this CSI process, while including a single entry indicates that the subframe patterns are not to be used for this CSI process. For a UE configured with TM10, E-UTRAN does not include 2 entries with *csi-MeasSubframeSet1* and *csi-MeasSubframeSet2* for CSI processes concerning a secondary frequency. Furthermore, E-UTRAN includes 2 entries when configuring both *cqi-pmi-ConfigIndex* and *cqi-pmi-ConfigIndex2*. |

#### – *PDCCH-ConfigSCell*

The IE *PDCCH-ConfigSCell* specifies PDCCH monitoring parameters that E-UTRAN may configure for a serving cell.

*PDCCH-ConfigSCell* information element

-- ASN1START

PDCCH-ConfigSCell-r13 ::= SEQUENCE {

skipMonitoringDCI-format0-1A-r13 ENUMERATED {true} OPTIONAL -- Need OR

}

PDCCH-ConfigLAA-r14 ::= SEQUENCE {

maxNumberOfSchedSubframes-Format0B-r14 ENUMERATED {sf2, sf3, sf4} OPTIONAL, -- Need OR

maxNumberOfSchedSubframes-Format4B-r14 ENUMERATED {sf2, sf3, sf4} OPTIONAL, -- Need OR

skipMonitoringDCI-Format0A-r14 ENUMERATED {true} OPTIONAL, -- Need OR

skipMonitoringDCI-Format4A-r14 ENUMERATED {true} OPTIONAL, -- Need OR

pdcch-CandidateReductions-Format0A-r14

PDCCH-CandidateReductions-r13 OPTIONAL, -- Need ON

pdcch-CandidateReductions-Format4A-r14

PDCCH-CandidateReductionsLAA-UL-r14 OPTIONAL, -- Need ON

pdcch-CandidateReductions-Format0B-r14

PDCCH-CandidateReductionsLAA-UL-r14 OPTIONAL, -- Need ON

pdcch-CandidateReductions-Format4B-r14

PDCCH-CandidateReductionsLAA-UL-r14 OPTIONAL -- Need ON

}

PDCCH-CandidateReductionValue-r13 ::= ENUMERATED {n0, n33, n66, n100}

PDCCH-CandidateReductionValue-r14 ::= ENUMERATED {n0, n50, n100, n150}

PDCCH-CandidateReductions-r13 ::= CHOICE {

release NULL,

setup SEQUENCE {

pdcch-candidateReductionAL1-r13 PDCCH-CandidateReductionValue-r13,

pdcch-candidateReductionAL2-r13 PDCCH-CandidateReductionValue-r13,

pdcch-candidateReductionAL3-r13 PDCCH-CandidateReductionValue-r13,

pdcch-candidateReductionAL4-r13 PDCCH-CandidateReductionValue-r13,

pdcch-candidateReductionAL5-r13 PDCCH-CandidateReductionValue-r13

}

}

PDCCH-CandidateReductionsLAA-UL-r14 ::= CHOICE {

release NULL,

setup SEQUENCE {

pdcch-candidateReductionAL1-r14 PDCCH-CandidateReductionValue-r13,

pdcch-candidateReductionAL2-r14 PDCCH-CandidateReductionValue-r13,

pdcch-candidateReductionAL3-r14 PDCCH-CandidateReductionValue-r14,

pdcch-candidateReductionAL4-r14 PDCCH-CandidateReductionValue-r14,

pdcch-candidateReductionAL5-r14 PDCCH-CandidateReductionValue-r14

}

}

-- ASN1STOP

|  |
| --- |
| *PDCCH-ConfigSCell* field descriptions |
| ***maxNumberOfSchedSubframes-Format0B***  Indicates maximum number of schedulable subframes for DCI format 0B as specified in TS 36.213 [23]. Value sf2 corresponds to 2 subframes, value sf3 corresponds to 3 subframes and so on. |
| ***maxNumberOfSchedSubframes-Format4B***  Indicates maximum number of schedulable subframes for DCI format 4B as specified in TS 36.213 [23]. Value sf2 corresponds to 2 subframes, value sf3 corresponds to 3 subframes and so on. |
| ***skipMonitoringDCI-format0-1A***  Indicates whether the UE is configured to omit monitoring DCI fromat 0/1A, see TS 36.213 [23], clause 9.1.1. |
| ***skipMonitoringDCI-Format0A***  Indicates whether the UE is configured to omit monitoring DCI fromat 0A as specified in TS 36.213 [23]. |
| ***skipMonitoringDCI-Format4A***  Indicates whether the UE is configured to omit monitoring DCI fromat 4A as specified in TS 36.213 [23]. |
| ***pdcch-candidateReductionALx***  Indicates reduced (E)PDCCH monitoring requirements on UE specific search space of the x-th aggregation level, see TS 36.213 [23], clause 9.1.1. Value n0 corresponds to 0%, value n33 corresponds to 33% and so on. |
| ***pdcch-CandidateReductions-Formatx***  Indicates number of blind detections on UE specific search space for each aggregation layer as specified in TS 36.213 [23]. The field can only be present when the UE is configured with uplink of an LAA SCell. If *pdcch-CandidateReductions-Formatx* is not configured, *pdcch-CandidateReductions-r13* applies to the corresponding DCIs (if configured). |

#### – *PDCP-Config*

The IE *PDCP-Config* is used to set the configurable PDCP parameters for data radio bearers.

*PDCP-Config* information element

-- ASN1START

PDCP-Config ::= SEQUENCE {

discardTimer ENUMERATED {

ms50, ms100, ms150, ms300, ms500,

ms750, ms1500, infinity

} OPTIONAL, -- Cond Setup

rlc-AM SEQUENCE {

statusReportRequired BOOLEAN

} OPTIONAL, -- Cond Rlc-AM-UM

rlc-UM SEQUENCE {

pdcp-SN-Size ENUMERATED {len7bits, len12bits}

} OPTIONAL, -- Cond Rlc-UM

headerCompression CHOICE {

notUsed NULL,

rohc SEQUENCE {

maxCID INTEGER (1..16383) DEFAULT 15,

profiles SEQUENCE {

profile0x0001 BOOLEAN,

profile0x0002 BOOLEAN,

profile0x0003 BOOLEAN,

profile0x0004 BOOLEAN,

profile0x0006 BOOLEAN,

profile0x0101 BOOLEAN,

profile0x0102 BOOLEAN,

profile0x0103 BOOLEAN,

profile0x0104 BOOLEAN

},

...

}

},

...,

[[ rn-IntegrityProtection-r10 ENUMERATED {enabled} OPTIONAL -- Cond RN

]],

[[ pdcp-SN-Size-v1130 ENUMERATED {len15bits} OPTIONAL -- Cond Rlc-AM2

]],

[[ ul-DataSplitDRB-ViaSCG-r12 BOOLEAN OPTIONAL, -- Need ON

t-Reordering-r12 ENUMERATED {

ms0, ms20, ms40, ms60, ms80, ms100, ms120, ms140,

ms160, ms180, ms200, ms220, ms240, ms260, ms280, ms300,

ms500, ms750, spare14, spare13, spare12, spare11, spare10,

spare9, spare8, spare7, spare6, spare5, spare4, spare3,

spare2, spare1} OPTIONAL -- Cond SetupS

]],

[[ ul-DataSplitThreshold-r13 CHOICE {

release NULL,

setup ENUMERATED {

b0, b100, b200, b400, b800, b1600, b3200, b6400, b12800,

b25600, b51200, b102400, b204800, b409600, b819200,

spare1}

} OPTIONAL, -- Need ON

pdcp-SN-Size-v1310 ENUMERATED {len18bits} OPTIONAL, -- Cond Rlc-AM3

statusFeedback-r13 CHOICE {

release NULL,

setup SEQUENCE {

statusPDU-TypeForPolling-r13 ENUMERATED {type1, type2} OPTIONAL, -- Need ON

statusPDU-Periodicity-Type1-r13 ENUMERATED {

ms5, ms10, ms20, ms30, ms40, ms50, ms60, ms70, ms80, ms90,

ms100, ms150, ms200, ms300, ms500, ms1000, ms2000, ms5000,

ms10000, ms20000, ms50000} OPTIONAL, -- Need ON

statusPDU-Periodicity-Type2-r13 ENUMERATED {

ms5, ms10, ms20, ms30, ms40, ms50, ms60, ms70, ms80, ms90,

ms100, ms150, ms200, ms300, ms500, ms1000, ms2000, ms5000,

ms10000, ms20000, ms50000} OPTIONAL, -- Need ON

statusPDU-Periodicity-Offset-r13 ENUMERATED {

ms1, ms2, ms5, ms10, ms25, ms50, ms100, ms250, ms500,

ms2500, ms5000, ms25000} OPTIONAL -- Need ON

}

} OPTIONAL -- Need ON

]],

[[ ul-LWA-Config-r14 CHOICE {

release NULL,

setup SEQUENCE {

ul-LWA-DRB-ViaWLAN-r14 BOOLEAN,

ul-LWA-DataSplitThreshold-r14 ENUMERATED {

b0, b100, b200, b400, b800, b1600, b3200, b6400,

b12800, b25600, b51200, b102400, b204800, b409600,

b819200 } OPTIONAL -- Need OR

}

} OPTIONAL, -- Need ON

uplinkOnlyHeaderCompression-r14 CHOICE {

notUsed-r14 NULL,

rohc-r14 SEQUENCE {

maxCID-r14 INTEGER (1..16383) DEFAULT 15,

profiles-r14 SEQUENCE {

profile0x0006-r14 BOOLEAN

},

...

}

} OPTIONAL -- Need ON

]],

[[ uplinkDataCompression-r15 SEQUENCE {

bufferSize-r15 ENUMERATED {kbyte2, kbyte4, kbyte8, spare1},

dictionary-r15 ENUMERATED {sip-SDP, operator} OPTIONAL, -- Need OR

...

} OPTIONAL,-- Cond Rlc-AM4

pdcp-DuplicationConfig-r15 CHOICE {

release NULL,

setup SEQUENCE {

pdcp-Duplication-r15 ENUMERATED {configured, activated}

}

} OPTIONAL -- Need ON

]],

[[

ethernetHeaderCompression-r16 SetupRelease {EthernetHeaderCompression-r16} OPTIONAL -- Need ON

]],

[[ discardTimerExt-r17 SetupRelease {DiscardTimerExt-r17} OPTIONAL -- Need ON

]]

}

EthernetHeaderCompression-r16 ::= SEQUENCE {

ehc-Common-r16 SEQUENCE {

ehc-CID-Length-r16 ENUMERATED {bits7, bits15}

},

ehc-Downlink-r16 SEQUENCE {

drb-ContinueEHC-DL-r16 ENUMERATED {true} OPTIONAL -- Need OR

} OPTIONAL,-- Need ON

ehc-Uplink-r16 SEQUENCE {

maxCID-EHC-UL-r16 INTEGER (1..32767),

drb-ContinueEHC-UL-r16 ENUMERATED {true} OPTIONAL -- Need OR

} OPTIONAL, -- Need ON

...

}

DiscardTimerExt-r17 ::= ENUMERATED {ms2000, spare}

-- ASN1STOP

| *PDCP-Config* field descriptions |
| --- |
| ***bufferSize***  Indicates the buffer size applied for UDC specified in TS 36.323 [8]. Value *kbyte2* means 2048 bytes, *kbyte4* means 4096 bytes and so on. |
| ***dictionary***  Indicates which pre-defined dictionary is used for UDC as specified in TS 36.323 [8]. The value *sip-SDP* means that UE shall prefill the buffer with standard dictionary for SIP and SDP defined in TS 36.323 [8], and the value *operator* means that UE shall prefill the buffer with operator-defined dictionary. |
| ***discardTimer***  Indicates the discard timer value specified in TS 36.323 [8]. Value in milliseconds. Value ms50 means 50 ms, ms100 means 100 ms and so on. |
| ***discardTimerExt***  Indicates the discard timer value specified in TS 36.323 [8]. Value in milliseconds. Value *ms2000* means 2000 ms.  The UE shall use the extended value *discardTimerExt*, if present, and ignore the value signaled by *discardTimer*. |
| ***drb-ContinueEHC-DL***  Indicates whether the PDCP entity continues or resets the downlink EHC header compression protocol during PDCP re-establishment, as specified in TS 36.323 [8]. The field is configured only in case of resuming an RRC connection or reconfiguration with sync, where the PDCP termination point is not changed and the *fullConfig* is not indicated. |
| ***drb-ContinueEHC-UL***  Indicates whether the PDCP entity continues or resets the uplink EHC header compression protocol during PDCP re-establishment, as specified in TS 36.323 [8]. The field is configured only in case of resuming an RRC connection or reconfiguration with sync, where the PDCP termination point is not changed and the *fullConfig* is not indicated. |
| ***ehc-CID-Length***  Indicates the length of the CID field for EHC packet. Once the field *ethernetHeaderCompression-r16* is configured for a DRB, the value of the field *ehc-CID-Length* for this DRB is not reconfigured to a different value. |
| ***ehc-Common***  Indicates the configurations that apply for both downlink and uplink. |
| ***ehc-Downlink***  Indicates the configurations that apply for only downlink. If the field is configured, then Ethernet header compression is configured for downlink. Otherwise, it is not configured for downlink. |
| ***ehc-Uplink***  Indicates the configurations that apply for only uplink. If the field is configured, then Ethernet header compression is configured for uplink. Otherwise, it is not configured for uplink. |
| ***ethernetHeaderCompression***  This field configures Ethernet Header Compression. This field can only be configured for DRB.  E-UTRAN does not reconfigure *ethernetHeaderCompression* for an MCG DRB except for upon handover and upon the first reconfiguration after RRC connection re-establishment. E-UTRAN does not reconfigure *ethernetHeaderCompression* for a SCG DRB except for upon SCG change involving PDCP re-establishment.  E-UTRAN does not configure this field if *uplinkDataCompression* is configured. E-UTRAN does not configure this field for split and LWA DRBs*.* |
| ***headerCompression***  E-UTRAN does not reconfigure header compression for an MCG DRB except for upon handover and upon the first reconfiguration after RRC connection re-establishment, and without any *drb-ContinueROHC*. E-UTRAN does not reconfigure header compression for a SCG DRB except for upon SCG change involving PDCP re-establishment. E-UTRAN does not configure header compression while *t-Reordering* is configured except for DAPS bearers. E-UTRAN only configures this field when neither *uplinkOnlyHeaderCompression* nor *uplinkDataCompression* is configured.  If *headerCompression* is configured, the UE shall apply the configured ROHC profile(s) in both uplink and downlink. ROHC and EHC can be both configured simultaneously for a DRB. |
| ***maxCID***  Indicates the value of the MAX\_CID parameter as specified in TS 36.323 [8]. The total value of MAX\_CIDs across all bearers for the UE should be less than or equal to the value of *maxNumberROHC-ContextSessions* parameter as indicated by the UE. |
| ***maxCID-EHC-UL***  Indicates the value of the MAX\_CID\_EHC\_UL parameter as specified in TS 36.323 [8]. The total value of MAX\_CID\_EHC\_UL across all bearers for the UE should be less than or equal to the value of *maxNumberEHC-Contexts* parameter as indicated by the UE. |
| ***pdcp-Duplication***  Parameter for configuring PDCP duplication as specified in TS 36.323 [8]. Value *configured* indicates that PDCP duplication is configured but initially deactivated and value *activated* indicates that PDCP duplication is configured and activated upon configuration. For EN-DC, E-UTRAN configures PDCP duplication for MCG DRB only if PDCP duplication is not configured for any split DRB. PDCP duplication is not supported during a DAPS handover. |
| ***pdcp-SN-Size***  Indicates the PDCP Sequence Number length in bits. For RLC UM: value *len7bits* means that the 7-bit PDCP SN format is used and *len12bits* means that the 12-bit PDCP SN format is used. For RLC AM: value *len15bits* means that the 15-bit PDCP SN format is used, value *len18bits* means that the 18-bit PDCP SN format is used, otherwise if the field is not included upon setup of the PCDP entity 12-bit PDCP SN format is used, as specified in TS 36.323 [8]. |
| ***profiles***  The profiles used by both compressor and decompressor in both UE and E-UTRAN. The field indicates which of the ROHC profiles specified in TS 36.323 [8] are supported, i.e. value *true* indicates that the profile is supported. Profile 0x0000 shall always be supported when the use of ROHC is configured. If support of two ROHC profile identifiers with the same 8 LSB's is signalled, only the profile corresponding to the highest value shall be applied. |
| ***statusFeedback***  Indicates whether the UE shall send PDCP Status Report periodically or by E-UTRAN polling as specified in TS 36.323 [8]. E-UTRAN configures this field only for LWA DRB. |
| ***statusPDU-TypeForPolling***  Indicates the PDCP Control PDU option when it is triggered by E-UTRAN polling. Value *type1* indicates using the legacy PDCP Control PDU for PDCP status reporting and value *type2* indicates using the LWA specific PDCP Control PDU for LWA status reporting as specified in TS 36.323 [8]. |
| ***statusPDU-Periodicity-Type1***  Indicates the value of the PDCP Status reporting periodicity for *type1* Status PDU, as specified in TS 36.323 [8]. Value in milliseconds. Value ms5 means 5 ms, ms10 means 10 ms and so on. |
| ***statusPDU-Periodicity-Type2***  Indicates the value of the PDCP Status reporting periodicity for *type2* Status PDU, as specified in TS 36.323 [8]. Value in milliseconds. Value ms5 means 5 ms, ms10 means 10 ms and so on. |
| ***statusPDU-Periodicity-Offset***  Indicates the value of the offset for *type2* Status PDU periodicity, as specified in TS 36.323 [8]. Value in milliseconds. Value ms1 means 1 ms, ms2 means 2 ms and so on. |
| ***t-Reordering***  Indicates the value of the reordering timer, as specified in TS 36.323 [8]. Value in milliseconds. Value ms0 means 0 ms and behaviour as specified in 7.3.2 applies, ms20 means 20 ms and so on. |
| ***rn-IntegrityProtection***  Indicates that integrity protection or verification shall be applied for all subsequent packets received and sent by the RN on the DRB. |
| ***statusReportRequired***  Indicates whether or not the UE shall send a PDCP Status Report upon re-establishment of the PDCP entity, upon PDCP data recovery, upon uplink data switching during DAPS handover and upon release of the source cell after DAPS handover as specified in TS 36.323 [8]. If the UE supports DAPS handover, for RLC UM radio bearers, the field has the value FALSE if it has not been configured. |
| ***ul-DataSplitDRB-ViaSCG***  Indicates whether the UE shall send PDCP PDUs via SCG as specified in TS 36.323 [8]. E-UTRAN only configures the field (i.e. indicates value *TRUE*) for split DRBs. For PDCP duplication, if this field is set to *TRUE*, the primary RLC entity is SCG RLC entity and the secondary RLC entity is MCG RLC entity. If this field is not configured or set to *FALSE*, the primary RLC entity is MCG RLC entity and the secondary RLC entity is SCG RLC entity. |
| ***ul-DataSplitThreshold***  Indicates the threshold value for uplink data split operation specified in TS 36.323 [8]. Value b100 means 100 Bytes, b200 means 200 Bytes and so on. E-UTRAN only configures this field for split DRBs. |
| ***ul-LWA-DRB-ViaWLAN***  Indicates whether the UE shall send PDCP PDUs via the LWAAP entity as specified in TS 36.323 [8]. E‑UTRAN only configures this field (i.e. indicates value *TRUE*) for LWA DRBs. |
| ***ul-LWA-DataSplitThreshold***  Indicates the threshold value for uplink data split operation as specified in TS 36.323 [8]. Value b0 means 0 Bytes, b100 means 100 Bytes and so on. E-UTRAN only configures this field for LWA DRBs. |
| ***uplinkDataCompression***  Indicates the UDCconfiguration that the UE shall apply**.** E-UTRAN does not configure *uplinkDataCompression* for a DRB, if *ethernetHeaderCompression, headerCompression* or *uplinkOnlyHeaderCompression* is already configured for the DRB. E-UTRAN does not configure *uplinkDataCompression* for the split and LWA DRBs*.*The maximum number of DRBs where *uplinkDataCompression* can be applied is two. In this version of the specification, for existing DRBs, E-UTRAN can only (re)configure *uplinkDataCompression* via handover procedure or the first *RRCConnectionReconfiguration* message after RRC connection re-establishment. |
| ***uplinkOnlyHeaderCompression***  Indicates the ROHC configuration that the UE shall apply uplink-only ROHC operations, see TS 36.323 [8]. E-UTRAN only configures this field when *headerCompression* is not configured.  E-UTRAN does not reconfigure header compression for an MCG DRB except for upon handover and upon the first reconfiguration after RRC connection re-establishment. E-UTRAN does not reconfigure header compression for a SCG DRB except for upon SCG change involving PDCP re-establishment. For split and LWA DRBs E-UTRAN configures only *notUsed*. |

| Conditional presence | Explanation |
| --- | --- |
| *Rlc-AM-UM* | The field is mandatory present upon setup of a PDCP entity for a radio bearer configured with RLC AM. The field is optional, need ON, in case of reconfiguration of a PDCP entity at handover, at the first reconfiguration after RRC re-establishment or at SCG change involving PDCP re-establishment or PDCP data recovery for a radio bearer configured with RLC AM. If the UE supports DAPS handover, this field is optional, need ON, for a radio bearer configured with RLC UM. Otherwise the field is not present. |
| *Rlc-AM2* | The field is optionally present, need OP, upon setup of a PDCP entity for a radio bearer configured with RLC AM. Otherwise the field is not present. |
| *Rlc-AM3* | The field is optionally present, need OP, upon setup of a PDCP entity for a radio bearer configured with RLC AM, if *pdcp-SN-Size-v1130* is absent. Otherwise the field is not present. |
| *Rlc-AM4* | The field is optionally present, need ON, upon setup of a PDCP entity for a radio bearer configured with RLC AM. The field is optional, need OP, in case of reconfiguration of a PDCP entity at handover, or at the first reconfiguration after RRC re-establishment. Otherwise the field is not present and the UE shall continue to use the existing value. |
| *Rlc-UM* | The field is mandatory present upon setup of a PDCP entity for a radio bearer configured with RLC UM. It is optionally present, Need ON, upon handover within E-UTRA, upon the first reconfiguration after re-establishment and upon SCG change involving PDCP re-establishment. Otherwise the field is not present. |
| *RN* | The field is optionally present when signalled to the RN, need OR. Otherwise the field is not present. |
| *Setup* | The field is mandatory present in case of radio bearer setup. Otherwise the field is optionally present, need ON. |
| *SetupS* | The field is mandatory present in case of setup of or reconfiguration to a split DRB or LWA DRB as well as in case of setup of or reconfiguration to a DRB associated with at least one RLC entity configured with *rlc-OutOfOrderDelivery*. The field is optionally present upon reconfiguration of a split DRB or LWA DRB or upon DRB type change from split to MCG DRB or from LWA to LTE only as well as upon reconfiguration of a DRB associated with at least one RLC entity configured with *rlc-OutOfOrderDelivery*, need ON. Otherwise the field is not present. |

#### – *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

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-v1610 ::= SEQUENCE {

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

}

PDSCH-ConfigDedicated-v1700 ::= SEQUENCE {

ce-PDSCH-14HARQ-Config-r17 SetupRelease {CE-PDSCH-14HARQ-Config-r17} OPTIONAL, -- Need ON

ce-PDSCH-maxTBS-r17 ENUMERATED {enabled} OPTIONAL -- Need OR

}

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-AckBundling-r16 ENUMERATED {on} OPTIONAL -- Need OR

}

CE-PDSCH-14HARQ-Config-r17 ::= SEQUENCE {

ce-HARQ-AckDelay-r17 ENUMERATED {alt-1, alt-2e}

}

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-HARQ-AckDelay***  Configures the HARQ ACK delay between different subframe types and absolute subframes when UE is configured with 14 HARQ, see TS 36.212 [22] and TS 36.213 [23]. Value *alt-1* corresponds to Alt-1 and value *alt-2e* corresponds to Alt-2e. | |
| ***ce-PDSCH-14HARQ-Config***  Indicates whether 14-HARQ is enabled for HD-FDD BL UE, see TS 36.211 [21], TS 36.212 [22] and TS 36.213 [23]. E-UTRAN may set this field to setup only when DL multi-TB scheduling is not enabled and PUCCH repetition with HARQ-ACK bundling is not configured. |
| ***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-maxTBS***  Indicates whether DL TBS of 1736 bits is enabled for HD-FDD BL UE in CE mode A, see TS 36.213 [23], clause TBD. | |
| ***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-AckBundling***  Indicates whether HARQ-ACK bundling for DL multi-TB scheduling is enabled, see TS 36.213 [23], clause 7.3. |
| ***interleaving***  Indicates whether interleaving for DL multi-TB scheduling is enabled, see TS 36.213 [23], clause 7.1.11. |
| ***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. |

#### – *PDSCH-RE-MappingQCL-ConfigId*

The IE *PDSCH-RE-MappingQCL-ConfigId* is used to identify a set of PDSCH parameters related to resource element mapping and quasi co-location, as configured by the IE *PDSCH-RE-MappingQCL-Config*. The identity is unique within the scope of a carrier frequency.

*PDSCH-RE-MappingQCL-ConfigId* information elements

-- ASN1START

PDSCH-RE-MappingQCL-ConfigId-r11 ::= INTEGER (1..maxRE-MapQCL-r11)

-- ASN1STOP

#### *– PerCC-GapIndicationList*

The IE *PerCC-GapIndicationList* is used to specify the UE measurement gap preference.

*PerCC-GapIndication* information elements

-- ASN1START

PerCC-GapIndicationList-r14 ::= SEQUENCE (SIZE (1..maxServCell-r13)) OF PerCC-GapIndication-r14

PerCC-GapIndication-r14 ::= SEQUENCE {

servCellId-r14 ServCellIndex-r13,

gapIndication-r14 ENUMERATED {gap, ncsg, nogap-noNcsg}

}

-- ASN1STOP

| *PerCC-GapIndication* field descriptions |
| --- |
| ***servCellId***  This field identifies the serving cell for which the measurement gap perference is provided. |
| ***gapIndication***  This field is used to indicate the measurement gap preference per component carrier (serving cell) by the UE both in non-CA and CA configurations. Value *gap* indicates that a measurement gap is needed for the associated *servCellId*, value *nogap-noNcsg* indicates that neither a measurement gap nor a ncsg is needed for the associated *servCellId*, value *ncsg* indicates that ncsg is needed for the associated *servCellId*. The UE shall indicate the per CC measurement gap preference consistently for the same non-CA or CA configuration and measurement configuration during the same RRC connection. |

#### – *PHICH-Config*

The IE *PHICH-Config* is used to specify the PHICH configuration.

*PHICH-Config* information element

-- ASN1START

PHICH-Config ::= SEQUENCE {

phich-Duration ENUMERATED {normal, extended},

phich-Resource ENUMERATED {oneSixth, half, one, two}

}

-- ASN1STOP

| *PHICH-Config* field descriptions |
| --- |
| ***phich-Duration***  Parameter: *PHICH-Duration*, see TS 36.211 [21], Table 6.9.3-1. |
| ***phich-Resource***  Parameter: *Ng*, see TS 36.211 [21], clause 6.9. Value oneSixth corresponds to 1/6, half corresponds to 1/2 and so on. |

#### – *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-v1610 PDSCH-ConfigDedicated-v1610 OPTIONAL, -- Need ON

pusch-ConfigDedicated-v1610 PUSCH-ConfigDedicated-v1610 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

soundingRS-UL-ConfigDedicatedAdd-r16 SetupRelease {SoundingRS-UL-ConfigDedicatedAdd-r16}

OPTIONAL, -- Need ON

uplinkPowerControlAddSRS-r16 SetupRelease {UplinkPowerControlAddSRS-r16} OPTIONAL, -- Need ON

soundingRS-VirtualCellID-r16 SetupRelease {SoundingRS-VirtualCellID-r16} OPTIONAL, -- Need ON

widebandPRG-r16 SetupRelease {WidebandPRG-r16} OPTIONAL -- Need ON

]],

[[ pdsch-ConfigDedicated-v1700 PDSCH-ConfigDedicated-v1700 OPTIONAL, -- Need ON

ntn-ConfigDedicated-r17 SEQUENCE {

pucch-TxDuration-r17 SetupRelease {PUCCH-TxDuration-r17} OPTIONAL, -- Need ON

pusch-TxDuration-r17 SetupRelease {PUSCH-TxDuration-r17} OPTIONAL -- Need ON

} OPTIONAL --Cond NTN

]]

}

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 SetupRelease {SoundingRS-UL-ConfigDedicatedAdd-r16}

OPTIONAL, -- Need ON

uplinkPowerControlAddSRS-r16 SetupRelease {UplinkPowerControlAddSRS-r16}

OPTIONAL, -- Need ON

soundingRS-VirtualCellID-r16 SetupRelease {SoundingRS-VirtualCellID-r16}

OPTIONAL, -- Need ON

widebandPRG-r16 SetupRelease {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]. |
| ***cfi-SlotSubslotNonMBSFN***  Indicates the semi-static control format indicator for slot/subslot operation in non-MBSFN subframes. |
| ***cfi-SlotSubslotMBSFN***  Indicates the semi-static control format indicator for slot/subslot operation in MBSFN subframes. |
| ***cfi-SubframeMBSFN***  Indicates the semi-static control format indicator for subframe operation in MBSFN subframes. |
| ***cfi-SubframeNonMBSFN***  Indicates the semi-static control format indicator for subframe operation in non-MBSFN subframes. |
| ***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. |
| ***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. |
| ***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]. |
| ***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 *SystemInformationBlockType29* applies. |
| *resourceReservationConfigDedicatedUL*  Indicates whether the UL resource reservation is enabled for the UE, e.g. for NR coexistence. If the field is set to *setup* and *resourceReservationDedicatedUL* is not included, then *resourceReservationConfigCommonUL* in *SystemInformationBlockType29* applies. |
| ***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). |
| ***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. |
| *NTN* | The field is optionally present, Need ON, for NTN. Otherwise, the field is not present and the UE shall delete any existing value for this field. |
| *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.

#### – *P-Max*

The IE *P-Max* is used to limit the UE's uplink transmission power on a carrier frequency and is used to calculate the parameter *Pcompensation* defined in TS 36.304 [4]. Corresponds to parameter PEMAX or PEMAX,c in TS 36.101 [42]. The UE transmit power on one serving cell shall not exceed the configured maximum UE output power of the serving cell determined by this value as specified in TS 36.101 [42], clauses 6.2.5 or 6.2.5A, or, when transmitting sidelink discovery announcements within the coverage of the concerned cell, as specified in TS 36.101 [42], clause 6.2.5D.

*P-Max* information element

-- ASN1START

P-Max ::= INTEGER (-30..33)

-- ASN1STOP

#### – *PRACH-Config*

The IE *PRACH-ConfigSIB* and IE *PRACH-Config* are used to specify the PRACH configuration in the system information and in the mobility control information, respectively.

*PRACH-Config* information elements

-- ASN1START

PRACH-ConfigSIB ::= SEQUENCE {

rootSequenceIndex INTEGER (0..837),

prach-ConfigInfo PRACH-ConfigInfo

}

PRACH-ConfigSIB-v1310 ::= SEQUENCE {

rsrp-ThresholdsPrachInfoList-r13 RSRP-ThresholdsPrachInfoList-r13,

mpdcch-startSF-CSS-RA-r13 CHOICE {

fdd-r13 ENUMERATED {v1, v1dot5, v2, v2dot5, v4, v5, v8,

v10},

tdd-r13 ENUMERATED {v1, v2, v4, v5, v8, v10, v20, spare}

} OPTIONAL, -- Cond MP

prach-HoppingOffset-r13 INTEGER (0..94) OPTIONAL, -- Need OR

prach-ParametersListCE-r13 PRACH-ParametersListCE-r13

}

PRACH-ConfigSIB-v1530 ::= SEQUENCE {

edt-PRACH-ParametersListCE-r15 SEQUENCE (SIZE(1..maxCE-Level-r13)) OF EDT-PRACH-ParametersCE-r15

}

PRACH-Config ::= SEQUENCE {

rootSequenceIndex INTEGER (0..837),

prach-ConfigInfo PRACH-ConfigInfo OPTIONAL -- Need ON

}

PRACH-Config-v1310 ::= SEQUENCE {

rsrp-ThresholdsPrachInfoList-r13 RSRP-ThresholdsPrachInfoList-r13 OPTIONAL, -- Cond MP

mpdcch-startSF-CSS-RA-r13 CHOICE {

fdd-r13 ENUMERATED {v1, v1dot5, v2, v2dot5, v4, v5, v8,

v10},

tdd-r13 ENUMERATED {v1, v2, v4, v5, v8, v10, v20, spare}

} OPTIONAL, -- Cond MP

prach-HoppingOffset-r13 INTEGER (0..94) OPTIONAL, -- Need OR

prach-ParametersListCE-r13 PRACH-ParametersListCE-r13 OPTIONAL, -- Cond MP

initial-CE-level-r13 INTEGER (0..3) OPTIONAL -- Need OR

}

PRACH-Config-v1430 ::= SEQUENCE {

rootSequenceIndexHighSpeed-r14 INTEGER (0..837),

zeroCorrelationZoneConfigHighSpeed-r14 INTEGER (0..12),

prach-ConfigIndexHighSpeed-r14 INTEGER (0..63),

prach-FreqOffsetHighSpeed-r14 INTEGER (0..94)

}

PRACH-ConfigSCell-r10 ::= SEQUENCE {

prach-ConfigIndex-r10 INTEGER (0..63)

}

PRACH-ConfigInfo ::= SEQUENCE {

prach-ConfigIndex INTEGER (0..63),

highSpeedFlag BOOLEAN,

zeroCorrelationZoneConfig INTEGER (0..15),

prach-FreqOffset INTEGER (0..94)

}

PRACH-ParametersListCE-r13 ::= SEQUENCE (SIZE(1..maxCE-Level-r13)) OF PRACH-ParametersCE-r13

PRACH-ParametersCE-r13 ::= SEQUENCE {

prach-ConfigIndex-r13 INTEGER (0..63),

prach-FreqOffset-r13 INTEGER (0..94),

prach-StartingSubframe-r13 ENUMERATED {sf2, sf4, sf8, sf16, sf32, sf64, sf128,

sf256} OPTIONAL, -- Need OP

maxNumPreambleAttemptCE-r13

ENUMERATED {n3, n4, n5, n6, n7, n8, n10} OPTIONAL, -- Need OP

numRepetitionPerPreambleAttempt-r13 ENUMERATED {n1,n2,n4,n8,n16,n32,n64,n128},

mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF

INTEGER (1..maxAvailNarrowBands-r13),

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

r32, r64, r128, r256},

prach-HoppingConfig-r13 ENUMERATED {on,off}

}

EDT-PRACH-ParametersCE-r15 ::= SEQUENCE {

edt-PRACH-ParametersCE-r15 SEQUENCE {

prach-ConfigIndex-r15 INTEGER (0..63),

prach-FreqOffset-r15 INTEGER (0..94),

prach-StartingSubframe-r15 ENUMERATED {sf2, sf4, sf8, sf16, sf32, sf64, sf128, sf256} OPTIONAL, -- Need OP

mpdcch-NarrowbandsToMonitor-r15 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)

} OPTIONAL -- Need OR

}

RSRP-ThresholdsPrachInfoList-r13 ::= SEQUENCE (SIZE(1..3)) OF RSRP-Range

PRACH-TxDuration-r17::= SEQUENCE {

prach-TxDuration-r17 ENUMERATED {n1, n2, n4, n8, n16, n32, n64, n128}

}

-- ASN1STOP

| *PRACH-Config* field descriptions |
| --- |
| ***edt-PRACH-ParametersListCE***  Configures PRACH parameters for each CE level applicable to a UE performing EDT. If included, the number of entries is same as number of entries in *prach-ParametersListCE*. The first entry in the list is the PRACH parameters for CE level 0, the second entry in the list is the PRACH parameters for CE level 1, and so on. The parameters *maxNumPreambleAttemptCE*, *numRepetitionPerPreambleAttempt*, *mpdcch-NumRepetition-RA*, *prach-HoppingConfig* included in *prach-ParametersListCE* for CE level X are also applicable for EDT. |
| ***initial-CE-level***  Indicates initial PRACH CE level at random access, see TS 36.321 [6]. If not configured, UE selects PRACH CE level based on measured RSRP level, see TS 36.321 [6]. |
| ***highSpeedFlag***  Parameter: High-speed-flag, see TS 36.211 [21], clause 5.7.2]. TRUE corresponds to Restricted set and FALSE to Unrestricted set. |
| ***maxNumPreambleAttemptCE***  Maximum number of preamble transmission attempts per CE level. See TS 36.321 [6].  If the field is absent, the UE shall use the default value n3. |
| ***mpdcch-NarrowbandsToMonitor***  Narrowbands to monitor for MPDCCH for RAR, see TS 36.213 [23], clause 6.2. Field values (1..*maxAvailNarrowBands-r13*) correspond to narrowband indices (0..*maxAvailNarrowBands-r13*-1) as specified in TS 36.211 [21]. |
| ***mpdcch-NumRepetition-RA***  Maximum number of repetitions for MPDCCH common search space (CSS) for RAR, Msg3 and Msg4, see TS 36.211 [21]. |
| ***mpdcch-startSF-CSS-RA***  Starting subframe configuration for MPDCCH common search space (CSS), including RAR, Msg3 retransmission, PDSCH with contention resolution and PDSCH with CCCH MAC SDU, see TS 36.211 [21] and TS 36.213 [23]. Value v1 corresponds to 1, value v1dot5 corresponds to 1.5, and so on. |
| ***numRepetitionPerPreambleAttempt***  Number of PRACH repetitions per attempt for each CE level, See TS 36.211 [21]. |
| ***prach-ConfigIndex***  Parameter: *prach-ConfigurationIndex*, see TS 36.211 [21], clause 5.7.1. |
| ***prach-ConfigIndexHighSpeed***  Parameter: *prach-ConfigurationIndexHighSpeed, see* TS 36.211 [21], clause 5.7.1. If this field is present, the UE shall ignore *prach-ConfigIndex*. |
| ***prach-FreqOffset***  Parameter: *prach-FrequencyOffset,* see TS 36.211 [21], clause 5.7.1. For TDD the value range is dependent on the value of *prach-ConfigIndex*. |
| ***prach-FreqOffsetHighSpeed***  Parameter: *prach-FrequencyOffsetHighSpeed, see* TS 36.211 [21], clause 5.7.1. For TDD the value range is dependent on the value of *prach-ConfigIndexHighSpeed*. If this field is present, the UE shall ignore *prach-FreqOffset*. |
| ***prach-HoppingConfig***  Coverage level specific frequency hopping configuration for PRACH. |
| ***prach-HoppingOffset***  Parameter: PRACH frequency hopping offset, expressed as a number of resource blocks, see TS 36.211 [21], clause 5.7.1. |
| ***prach-ParametersListCE***  Configures PRACH parameters for each CE level. The first entry in the list is the PRACH parameters of CE level 0, the second entry in the list is the PRACH parameters of CE level 1, and so on. |
| ***prach-StartingSubframe***  PRACH starting subframe periodicity, expressed in number of subframes available for preamble transmission (PRACH opportunities), see TS 36.211 [21]. Value sf2 corresponds to 2 subframes, sf4 corresponds to 4 subframes and so on. EUTRAN configures the PRACH starting subframe periodicity larger than or equal to the number of PRACH repetitions per attempt for each CE level (*numRepetitionPerPreambleAttempt*).  If the field is absent, the value is determined implicitly in TS 36.211 [21], clause 5.7.1. |
| ***prach-TxDuration***  Duration of PRACH segment transmission in NTN transmission, see TS 36.213 [23]. Unit in duration of one preamble transmission including guard period (TCP+TSEQ+TGP).  Value *n1* corresponds to the duration of 1 preamble transmission, value *n2* corresponds to the duration of 2 preambles transmission and so on. |
| ***rootSequenceIndex***  Parameter: *RACH\_ROOT\_SEQUENCE*, see TS 36.211 [21], clause 5.7.1. |
| ***rootSequenceIndexHighSpeed***  The fieldindicates starting logical root sequence index used to derive the 64 random access preambles based on restricted set type B in high speed scenario, see TS 36.211 [21], clause 5.7.2. If this field is present, the UE shall generate random access preambles based on restricted set type B and ignore *rootSequenceIndex*. |
| ***rsrp-ThresholdsPrachInfoList***  The criterion for BL UEs and UEs in CE to select PRACH resource set. Up to 3 RSRP threshold values are signalled to determine the CE level for PRACH, see TS 36.213 [23]. The first element corresponds to RSRP threshold 1, the second element corresponds to RSRP threshold 2 and so on, see TS 36.321 [6]. The UE shall ignore this field if only one CE level, i.e. CE level 0, is configured in *prach-ParametersListCE*. The number of RSRP thresholds present in *rsrp-ThresholdsPrachInfoList* is equal to the number of CE levels configured in *prach-ParametersListCE* minus one.  A UE that supports *powerClass-14dBm* shall correct the RSRP threshold values before applying them as follows:  RSRP threshold = Signalled RSRP threshold - min{0, (14-min(23, P-Max))} where P-Max is the value of *p-Max* field in *SystemInformationBlockType1-BR.* |
| ***zeroCorrelationZoneConfig***  Parameter: NCS configuration, see TS 36.211 [21], clause 5.7.2: table 5.7.2-2, for preamble format 0..3 and TS 36.211 [21], clause 5.7.2: table 5.7.2-3, for preamble format 4. |
| ***zeroCorrelationZoneConfigHighSpeed***  The field indicates NCS configuration for the restricted set type B in high speed scenario, see TS 36.211 [21], clause 5.7.2. If this field is present, the UE shall generate random access preambles based on restricted set type B and ignore *zeroCorrelationZoneConfig*. |

| Conditional presence | Explanation |
| --- | --- |
| *MP* | The field is mandatory present. |

#### – *PresenceAntennaPort1*

The IE *PresenceAntennaPort1* is used to indicate whether all the neighbouring cells use Antenna Port 1. When set to *TRUE*, the UE may assume that at least two cell-specific antenna ports are used in all neighbouring cells.

*PresenceAntennaPort1* information element

-- ASN1START

PresenceAntennaPort1 ::= BOOLEAN

-- ASN1STOP

#### – *PUCCH-Config*

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

*PUCCH-Config* information elements

-- ASN1START

PUCCH-ConfigCommon ::= SEQUENCE {

deltaPUCCH-Shift ENUMERATED {ds1, ds2, ds3},

nRB-CQI INTEGER (0..98),

nCS-AN INTEGER (0..7),

n1PUCCH-AN INTEGER (0..2047)

}

PUCCH-ConfigCommon-v1310 ::= SEQUENCE {

n1PUCCH-AN-InfoList-r13 N1PUCCH-AN-InfoList-r13 OPTIONAL, -- Need OR

pucch-NumRepetitionCE-Msg4-Level0-r13 ENUMERATED {n1, n2, n4, n8} OPTIONAL, -- Need OR

pucch-NumRepetitionCE-Msg4-Level1-r13 ENUMERATED {n1, n2, n4, n8} OPTIONAL, -- Need OR

pucch-NumRepetitionCE-Msg4-Level2-r13 ENUMERATED {n4, n8, n16, n32} OPTIONAL, -- Need OR

pucch-NumRepetitionCE-Msg4-Level3-r13 ENUMERATED {n4, n8, n16, n32} OPTIONAL -- Need OR

}

PUCCH-ConfigCommon-v1430 ::= SEQUENCE {

pucch-NumRepetitionCE-Msg4-Level3-r14 ENUMERATED {n64, n128} OPTIONAL -- Need OR

}

PUCCH-ConfigDedicated ::= SEQUENCE {

ackNackRepetition CHOICE{

release NULL,

setup SEQUENCE {

repetitionFactor ENUMERATED {n2, n4, n6, spare1},

n1PUCCH-AN-Rep INTEGER (0..2047)

}

},

tdd-AckNackFeedbackMode ENUMERATED {bundling, multiplexing} OPTIONAL -- Cond TDD

}

PUCCH-ConfigDedicated-v1020 ::= SEQUENCE {

pucch-Format-r10 CHOICE {

format3-r10 PUCCH-Format3-Conf-r13,

channelSelection-r10 SEQUENCE {

n1PUCCH-AN-CS-r10 CHOICE {

release NULL,

setup SEQUENCE {

n1PUCCH-AN-CS-List-r10 SEQUENCE (SIZE (1..2)) OF N1PUCCH-AN-CS-r10

}

} OPTIONAL -- Need ON

}

} OPTIONAL, -- Need OR

twoAntennaPortActivatedPUCCH-Format1a1b-r10 ENUMERATED {true} OPTIONAL, -- Need OR

simultaneousPUCCH-PUSCH-r10 ENUMERATED {true} OPTIONAL, -- Need OR

n1PUCCH-AN-RepP1-r10 INTEGER (0..2047) OPTIONAL -- Need OR

}

PUCCH-ConfigDedicated-v1130 ::= SEQUENCE {

n1PUCCH-AN-CS-v1130 CHOICE {

release NULL,

setup SEQUENCE {

n1PUCCH-AN-CS-ListP1-r11 SEQUENCE (SIZE (2..4)) OF INTEGER (0..2047)

}

} OPTIONAL, -- Need ON

nPUCCH-Param-r11 CHOICE {

release NULL,

setup SEQUENCE {

nPUCCH-Identity-r11 INTEGER (0..503),

n1PUCCH-AN-r11 INTEGER (0..2047)

}

} OPTIONAL -- Need ON

}

PUCCH-ConfigDedicated-v1250 ::= SEQUENCE {

nkaPUCCH-Param-r12 CHOICE {

release NULL,

setup SEQUENCE {

nkaPUCCH-AN-r12 INTEGER (0..2047)

}

}

}

PUCCH-ConfigDedicated-r13 ::= SEQUENCE {

--Release 8

ackNackRepetition-r13 CHOICE{

release NULL,

setup SEQUENCE {

repetitionFactor-r13 ENUMERATED {n2, n4, n6, spare1},

n1PUCCH-AN-Rep-r13 INTEGER (0..2047)

}

},

tdd-AckNackFeedbackMode-r13 ENUMERATED {bundling, multiplexing} OPTIONAL, -- Cond TDD

--Release 10

pucch-Format-r13 CHOICE {

format3-r13 SEQUENCE {

n3PUCCH-AN-List-r13 SEQUENCE (SIZE (1..4)) OF INTEGER (0..549) OPTIONAL, -- Need ON

twoAntennaPortActivatedPUCCH-Format3-r13 CHOICE {

release NULL,

setup SEQUENCE {

n3PUCCH-AN-ListP1-r13 SEQUENCE (SIZE (1..4)) OF INTEGER (0..549)

}

} OPTIONAL -- Need ON

},

channelSelection-r13 SEQUENCE {

n1PUCCH-AN-CS-r13 CHOICE {

release NULL,

setup SEQUENCE {

n1PUCCH-AN-CS-List-r13 SEQUENCE (SIZE (1..2)) OF N1PUCCH-AN-CS-r10,

dummy1 SEQUENCE (SIZE (2..4)) OF INTEGER (0..2047)

}

} OPTIONAL -- Need ON

},

format4-r13 SEQUENCE {

format4-resourceConfiguration-r13 SEQUENCE (SIZE (4)) OF Format4-resource-r13,

format4-MultiCSI-resourceConfiguration-r13 SEQUENCE (SIZE (1..2)) OF Format4-resource-r13 OPTIONAL -- Need OR

},

format5-r13 SEQUENCE {

format5-resourceConfiguration-r13 SEQUENCE (SIZE (4)) OF Format5-resource-r13,

format5-MultiCSI-resourceConfiguration-r13 Format5-resource-r13 OPTIONAL -- Need OR

}

} OPTIONAL, -- Need OR

twoAntennaPortActivatedPUCCH-Format1a1b-r13 ENUMERATED {true} OPTIONAL, -- Need OR

simultaneousPUCCH-PUSCH-r13 ENUMERATED {true} OPTIONAL, -- Need OR

n1PUCCH-AN-RepP1-r13 INTEGER (0..2047) OPTIONAL, -- Need OR

--Release 11

nPUCCH-Param-r13 CHOICE {

release NULL,

setup SEQUENCE {

nPUCCH-Identity-r13 INTEGER (0..503),

n1PUCCH-AN-r13 INTEGER (0..2047)

}

} OPTIONAL, -- Need ON

--Release 12

nkaPUCCH-Param-r13 CHOICE {

release NULL,

setup SEQUENCE {

nkaPUCCH-AN-r13 INTEGER (0..2047)

}

} OPTIONAL, -- Need ON

--Release 13

spatialBundlingPUCCH-r13 BOOLEAN,

spatialBundlingPUSCH-r13 BOOLEAN,

harq-TimingTDD-r13 BOOLEAN,

codebooksizeDetermination-r13 ENUMERATED {dai,cc} OPTIONAL, -- Need OR

maximumPayloadCoderate-r13 INTEGER (0..7) OPTIONAL, -- Need OR

pucch-NumRepetitionCE-r13 CHOICE {

release NULL,

setup CHOICE {

modeA SEQUENCE {

pucch-NumRepetitionCE-format1-r13 ENUMERATED {r1, r2, r4, r8},

pucch-NumRepetitionCE-format2-r13 ENUMERATED {r1, r2, r4, r8}

},

modeB SEQUENCE {

pucch-NumRepetitionCE-format1-r13 ENUMERATED {r4, r8, r16, r32},

pucch-NumRepetitionCE-format2-r13 ENUMERATED {r4, r8, r16, r32}

}

}

} OPTIONAL --Need ON

}

PUCCH-ConfigDedicated-v1370 ::= SEQUENCE {

pucch-Format-v1370 CHOICE {

release NULL,

setup PUCCH-Format3-Conf-r13

}

}

PUCCH-ConfigDedicated-v13c0 ::= SEQUENCE {

channelSelection-v13c0 SEQUENCE {

n1PUCCH-AN-CS-v13c0 CHOICE {

release NULL,

setup SEQUENCE {

n1PUCCH-AN-CS-ListP1-v13c0 SEQUENCE (SIZE (2..4)) OF INTEGER (0..2047)

}

}

}

}

PUCCH-Format3-Conf-r13 ::= SEQUENCE {

n3PUCCH-AN-List-r13 SEQUENCE (SIZE (1..4)) OF INTEGER (0..549) OPTIONAL, -- Need ON

twoAntennaPortActivatedPUCCH-Format3-r13 CHOICE {

release NULL,

setup SEQUENCE {

n3PUCCH-AN-ListP1-r13 SEQUENCE (SIZE (1..4)) OF INTEGER (0..549)

}

} OPTIONAL -- Need ON

}

PUCCH-ConfigDedicated-v1430 ::= SEQUENCE {

pucch-NumRepetitionCE-format1-r14 ENUMERATED {r64,r128} OPTIONAL -- Need OR

}

PUCCH-ConfigDedicated-v1530 ::= SEQUENCE {

n1PUCCH-AN-SPT-r15 INTEGER (0..2047) OPTIONAL, -- Need OR

codebooksizeDeterminationSTTI-r15 ENUMERATED {dai,cc} OPTIONAL -- Need OR

}

CE-PUCCH-TxDurationConfig-r17 ::= SEQUENCE {

ce-PUCCH-TxDuration-r17 ENUMERATED {sf2, sf4, sf8, sf16, sf32, sf64, sf128}

}

Format4-resource-r13 ::= SEQUENCE {

startingPRB-format4-r13 INTEGER (0..109),

numberOfPRB-format4-r13 INTEGER (0..7)

}

Format5-resource-r13 ::= SEQUENCE {

startingPRB-format5-r13 INTEGER (0..109),

cdm-index-format5-r13 INTEGER (0..1)

}

N1PUCCH-AN-CS-r10 ::= SEQUENCE (SIZE (1..4)) OF INTEGER (0..2047)

N1PUCCH-AN-InfoList-r13 ::= SEQUENCE (SIZE(1..maxCE-Level-r13)) OF INTEGER (0..2047)

PUCCH-TxDuration-r17 ::= SEQUENCE {

pucch-TxDuration-r17 ENUMERATED {sf2, sf4, sf8, sf16, sf32, sf64, sf128}

}

-- ASN1STOP

| *PUCCH-Config* field descriptions |
| --- |
| ***ackNackRepetition***  Parameter indicates whether ACK/NACK repetition is configured, see TS 36.213 [23], clause 10.1. |
| ***cdm-index-format5***  Parameter see TS 36.211 [21], clause 5.4.2c, for determining PUCCH resource(s) of PUCCH format 5. |
| ***codebooksizeDetermination, codebooksizeDeterminationSTTI***  Parameter indicates whether HARQ codebook size is determined with downlink assignment indicator based solution or number of configured CCs, see TS 36.212 [22], clauses 5.2.2.6, 5.2.3.1 and 5.3.3.1.2, and TS 36.213 [23], clauses 10.1.2.2.3, 10.1.3.2.3, 10.1.3.2.3.1, 10.1.3.2.3.2 and 10.1.3.2.4. |
| ***deltaPUCCH-Shift***  Parameter: , see TS 36.211 [21], clause 5.4.1, where ds1 corresponds to value 1, ds2 corresponds to value 2 etc. |
| ***dummy1***  This field is not used in the specification. If received it shall be ignored by the UE. |
| ***harq-TimingTDD***  Parameter indicates for a TDD SCell when aggregated with a TDD PCell of different UL/DL configurations whether deriving the HARQ timing for such a cell is done in the same way as the DL HARQ timing of an FDD SCell with a TDD PCell, see TS 36.213 [23], clause 10.2. |
| ***maximumPayloadCoderate***  Maximum payload or code rate for multi P-CSI on each PUCCH resource, see TS 36.213 [23], clause 10.1.1. |
| ***n1PUCCH-AN***  Parameter: , see TS 36.213 [23], clause 10.1.  *n1PUCCH-AN-r11* indicates UE-specific PUCCH AN resource offset, see TS 36.213 [23], clause 10.1. |
| ***n1PUCCH-AN-CS-List***  Parameter:  for antenna port  for PUCCH format 1b with channel selection, see TS 36.213 [23], clauses 10.1.2.2.1 and 10.1.3.2.1. |
| ***n1PUCCH-AN-CS-ListP1***  Parameter: for antenna port  for PUCCH format 1b with channel selection, see TS 36.213 [23], clause 10.1. E-UTRAN configures this field only when *pucch-Format* is set to *channelSelection*. |
| ***n1PUCCH-AN-Rep, n1PUCCH-AN-RepP1***  Parameter: for antenna port P0 and for antenna port P1 respectively, see TS 36.213 [23], clause 10.1. |
| ***n3PUCCH-AN-List, n3PUCCH-AN-ListP1***  Parameter: for antenna port P0 and for antenna port P1 respectively, see TS 36.213 [23], clause 10.1. |
| ***n1PUCCH-AN-SPT***  Parameter: , see TS 36.213 [23], clause 10.1. Indicates UE-specific PUCCH AN resource offset for short processing time. |
| ***nCS-An***  Parameter: see TS 36.211 [21], clause 5.4. |
| ***nkaPUCCH-AN***  Parameter: , see TS 36.213 [23], clause 10.1.3.  *nkaPUCCH-AN-r12* indicates PUCCH format 1a/1b starting offset for the subframe set , see TS 36.213 [23], clause 10.1.3. E-UTRAN configures *nkaPUCCH-AN* only if *eimta-MainConfig* is configured. |
| ***nPUCCH-Identity***  Parameter: , see TS 36.211 [21], clause 5.5.1.5. |
| ***nRB-CQI***  Parameter: , see TS 36.211 [21], clause 5.4. |
| ***numberOfPRB-format4***  Parameter see TS 36.213 [23], Table 10.1.1-2, for determining PUCCH resource(s) of PUCCH format 4. |
| ***n1PUCCH-AN-InfoList***  Starting offsets of the PUCCH resource(s) indicated by SIB1-BR. The first entry in the list is the starting offset of the PUCCH resource(s) of CE level 0, the second entry in the list is the starting offset of the PUCCH resource(s) of CE level 1, and so on. If E-UTRAN includes *n1PUCCH-AN-InfoList*, it includes the same number of entries as in *prach-ParametersListCE.* See TS 36.213 [23]. |
| ***pucch-Format***  Parameter indicates one of the PUCCH formats for transmission of HARQ-ACK, see TS 36.213 [23], clause 10.1. For TDD, if the UE is configured with PCell only, the *channelSelection* indicates the transmission of HARQ-ACK multiplexing as defined in Tables 10.1.3-5, 10.1.3-6, and 10.1.3-7 in TS 36.213 [23] for PUCCH, and in 7.3 in TS 36.213 [23] for PUSCH. E-UTRAN only configures *pucch-Format-v1370* when *pucch-Format-r13* is configured and set to *format4* or *format5*. |
| ***pucch-NumRepetitionCE***  Number of PUCCH repetitions for PUCCH format 1/1a and for PUCCH format 2/2a/2b for CE modes A and B, see TS 36.211 [21] and TS 36.213 [23]. The UE shall ignore *pucch-NumRepetitionCE-format2-r13,* if received*,* for CE mode B in this release of specification. For UE in CE mode B supporting extended PUCCH repetition, if *pucch-NumRepetitionCE-format1-r14* is included then the UE shall ignore *pucch-NumRepetitionCE-format1-r13*. |
| ***pucch-NumRepetitionCE-Msg4-Level0, pucch-NumRepetitionCE-Msg4-Level1, pucch-NumRepetitionCE-Msg4-Level2, pucch-NumRepetitionCE-Msg4-Level3***  Number of repetitions for PUCCH carrying HARQ response to PDSCH containing Msg4 for PRACH CE levels 0, 1, 2 and 3, see TS 36.211 [21] and TS 36.213 [23]. Value n1 corresponds to 1 repetition, value n2 corresponds to 2 repetitions, and so on. For BL UEs or non-BL UEs in enhanced coverage supporting extended PUCCH repetition, if *pucch-NumRepetitionCE-Msg4-Level3-r14* is included then the UE shall ignore *pucch-NumRepetitionCE-Msg4-Level3-r13*. |
| ***pucch-TxDuration***  Duration of PUCCH segment transmission in NTN transmission, see TS 36.213 [23]. Unit in subframe.  Value *sf2* corresponds to 2 subframes, value *sf4* corresponds to 4 subframes and so on. |
| ***repetitionFactor***  Parameter  see TS 36.213 [23], clause 10.1, where n2 corresponds to repetition factor 2, n4 to 4. |
| ***simultaneousPUCCH-PUSCH***  Parameter indicates whether simultaneous PUCCH and PUSCH or simultaneous SPUCCH and SlotOrSubslotPUSCH transmissions are configured, see TS 36.213 [23], clauses 10.1 and 5.1.1. E-UTRAN configures this field for the PCell, only when the *nonContiguousUL-RA-WithinCC-Info* is set to *supported* in the band on which PCell is configured. Likewise, E-UTRAN configures this field for the PSCell, only when the *nonContiguousUL-RA-WithinCC-Info* is set to *supported* in the band on which PSCell is configured. Likewise, E-UTRAN configures this field for the PUCCH SCell, only when the *nonContiguousUL-RA-WithinCC-Info* is set to *supported* in the band on which PUCCH SCell is configured. |
| ***spatialBundlingPUCCH***  Parameter indicates whether spatial bundling is enabled or not for PUCCH, see TS 36.212 [22], clause 5.2.3.1. |
| ***spatialBundlingPUSCH***  Parameter indicates whether spatial bundling is enabled or not for PUSCH, see see TS 36.212 [22], clause 5.2.2.6. |
| ***startingPRB-format4***  Parameter see TS 36.211 [21], clause5.4.3 for determining PUCCH resource(s) of PUCCH format 4. |
| ***startingPRB-format5***  Parameter see TS 36.211 [21], clause 5.4.3 for determining PUCCH resource(s) of PUCCH format 5. |
| ***tdd-AckNackFeedbackMode***  Parameter indicates one of the TDD ACK/NACK feedback modes used, see TS 36.213 [23], clauses 7.3 and 10.1.3. The value bundling corresponds to use of ACK/NACK bundling whereas, the value multiplexing corresponds to ACK/NACK multiplexing as defined in Tables 10.1.3-2, 10.1.3-3, and 10.1.3-4 in TS 36.213 [23]. The same value applies to both ACK/NACK feedback modes on PUCCH as well as on PUSCH. |
| ***twoAntennaPortActivatedPUCCH-Format1a1b***  Indicates whether two antenna ports are configured for PUCCH format 1a/1b for HARQ-ACK, see TS 36.213 [23], clause 10.1. The field also applies for PUCCH format 1a/1b transmission when *format3* is configured, see TS 36.213 [23], clauses 10.1.2.2.2 and 10.1.3.2.2. |
| ***twoAntennaPortActivatedPUCCH-Format3***  Indicates whether two antenna ports are configured for PUCCH format 3 for HARQ-ACK, see TS 36.213 [23], clause 10.1. |

| **Conditional presence** | **Explanation** |
| --- | --- |
| *TDD* | The field is mandatory present for TDD if the *pucch-Format* is not present. If the *pucch-Format* is present, the field is not present and the UE shall delete any existing value for this field. It is not present for FDD and the UE shall delete any existing value for this field. |

#### – *PUR-Config*

The IE *PUR-Config* is used to specify the PUR configuration.

*PUR-Config* information element

-- ASN1START

PUR-Config-r16 ::= SEQUENCE {

pur-ConfigID-r16 PUR-ConfigID-r16 OPTIONAL, -- Need OR

pur-ImplicitReleaseAfter-r16 ENUMERATED {n2, n4, n8, spare} OPTIONAL, -- Need OR

pur-StartTimeParameters-r16 SEQUENCE {

periodicityAndOffset-r16 PUR-PeriodicityAndOffset-r16,

startSFN-r16 INTEGER (0..1023),

startSubFrame-r16 INTEGER (0..9),

hsfn-LSB-Info-r16 BIT STRING (SIZE(1))

} 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-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-PDSCH-maxTBS-r17 BOOLEAN 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-r16 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,

locationCE-ModeB-r16 INTEGER (0..5) OPTIONAL -- Cond SubPRB

}

PUR-RSRP-ChangeThreshold-r16 ::= SEQUENCE {

increaseThresh-r16 RSRP-ChangeThresh-r16,

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. |
| ***hsfn-LSB-Info***  Indicates the LSB of the H-SFN corresponding to the last subframe of the first transmission of *RRCConnectionRelease* message containing *pur-Config*. |
| ***locationCE-ModeB***  PRB location within the narrowband when PUSCH sub-PRB resource allocation is enabled for PUR grant in CE mode B. |
| ***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***  Parameter: 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 PUR occasions that can be skipped before implicit release, as specified in 5.3.3.20. Value *n2* corresponds to 2 PUR occasions, value *n4* 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-PDSCH-maxTBS***  Activation/deactivation of DL TBS of 1736 bits for HD-FDD BL UE in CE mode A, see TS 36.213 [23], clause 7.1.7.2. |
| ***pur-PeriodicityAndOffset***  Indicates the periodicity for the PUR occasions and time offset until the first PUR occasion. |
| ***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(s) 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 *decreaseThresh* is absent the value of *increaseThresh* is also used for *decreaseThresh*. |
| ***pur-TimeAlignmentTimer***  Indicates the idle mode TA timer in seconds for TA validation. Actual value = indicated value \* PUR periodicity. |

| Conditional presence | Explanation |
| --- | --- |
| *SubPRB* | This field is optionally present, need ON, if *subPRB-Allocation* is set to TRUE; otherwise the field is not present and UE shall delete any existing value for this field. |

#### – *PUR-ConfigID*

The IE *PUR-ConfigID* is used to indicate the PUR configuration identity.

*PUR-ConfigID* information element

-- ASN1START

PUR-ConfigID-r16 ::= BIT STRING (SIZE(20))

-- ASN1STOP

#### – *PUR-PeriodicityAndOffset*

The IE *PUR-PeriodicityAndOffset* is used to indicate H-SFN of the first PUR occasion and periodicity of the subsequent PUR occasions. The value of periodicity is in the unit of H-SFN duration (i.e., 10.24s). Value *periodicity8* corresponds to periodicity of 8 H-SFN, value *periodicity16* corresponds to periodicity of 16 H-SFN and so on. The value of offset is in the unit of H-SFN duration (i.e., 10.24s).

*PUR-PeriodicityAndOffset* information element

-- ASN1START

PUR-PeriodicityAndOffset-r16 ::= CHOICE {

periodicity8 INTEGER (1..7),

periodicity16 INTEGER (1..15),

periodicity32 INTEGER (1..31),

periodicity64 INTEGER (1..63),

periodicity128 INTEGER (1..127),

periodicity256 INTEGER (1..255),

periodicity512 INTEGER (1..511),

periodicity1024 INTEGER (1..1023),

periodicity2048 INTEGER (1..2047),

periodicity4096 INTEGER (1..4095),

periodicity8192 INTEGER (1..8191)

}

-- ASN1STOP

#### – *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-v1610 ::= 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)

}

}

}

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

}

}

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

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

}

PUSCH-TxDuration-r17 ::= SEQUENCE {

pusch-TxDuration-r17 ENUMERATED {n2, n4, n8, n16, n32, n64, n128, n256}

}

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 as indicated in TS 36.306 [5], Table 4.1A-2*,* 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 as indicated in TS 36.306 [5], Table 4.1A-2*,* 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. |
| ***interleaving***  Indicates whether interleaving for UL multi-TB scheduling is enabled, see TS 36.213 [23], clause 8.0. |
| ***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]. |
| ***pusch-TxDuration***  Duration of PUSCH segment transmission in NTN transmission, see TS 36.213 [23]. Value in number of resource units. Value *n2* corresponds to 2 resource units, value *n4* corresponds to 4 resource units and so on.  The signalled value corresponds to full-PRB allocation (unit: subframe). If PUSCH sub-PRB is configured, the signalled value is divided by 2, 4 and 8 for sub-PRB allocation of 6, 3 and 2-out-of-3 tones allocation and corresponds to the resource unit for 6 tones, 3 and 2-out-of-3 tones, respectively. If value *n2* is signalled and PUSCH sub-PRB is configured, segment transmission is not applicable to 3 and 2-out-of-3 tones allocation. If value *n4* is signalled and PUSCH sub-PRB is configured, segment transmission is not applicable to 2-out-of-3 tones allocation. | |
| ***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. |

#### – *RACH-ConfigCommon*

The IE *RACH-ConfigCommon* is used to specify the generic random access parameters.

*RACH-ConfigCommon* information element

-- ASN1START

RACH-ConfigCommon ::= SEQUENCE {

preambleInfo SEQUENCE {

numberOfRA-Preambles ENUMERATED {

n4, n8, n12, n16, n20, n24, n28,

n32, n36, n40, n44, n48, n52, n56,

n60, n64},

preamblesGroupAConfig SEQUENCE {

sizeOfRA-PreamblesGroupA ENUMERATED {

n4, n8, n12, n16, n20, n24, n28,

n32, n36, n40, n44, n48, n52, n56,

n60},

messageSizeGroupA ENUMERATED {b56, b144, b208, b256},

messagePowerOffsetGroupB ENUMERATED {

minusinfinity, dB0, dB5, dB8, dB10, dB12,

dB15, dB18},

...

} OPTIONAL -- Need OP

},

powerRampingParameters PowerRampingParameters,

ra-SupervisionInfo SEQUENCE {

preambleTransMax PreambleTransMax,

ra-ResponseWindowSize ENUMERATED {

sf2, sf3, sf4, sf5, sf6, sf7,

sf8, sf10},

mac-ContentionResolutionTimer ENUMERATED {

sf8, sf16, sf24, sf32, sf40, sf48,

sf56, sf64}

},

maxHARQ-Msg3Tx INTEGER (1..8),

...,

[[ preambleTransMax-CE-r13 PreambleTransMax OPTIONAL, -- Need OR

rach-CE-LevelInfoList-r13 RACH-CE-LevelInfoList-r13 OPTIONAL -- Need OR

]],

[[ edt-SmallTBS-Subset-r15 ENUMERATED {true} OPTIONAL -- Cond EDT-OR

]]

}

RACH-ConfigCommon-v1250 ::= SEQUENCE {

txFailParams-r12 SEQUENCE {

connEstFailCount-r12 ENUMERATED {n1, n2, n3, n4},

connEstFailOffsetValidity-r12 ENUMERATED {s30, s60, s120, s240,

s300, s420, s600, s900},

connEstFailOffset-r12 INTEGER (0..15) OPTIONAL -- Need OP

}

}

RACH-ConfigCommonSCell-r11 ::= SEQUENCE {

powerRampingParameters-r11 PowerRampingParameters,

ra-SupervisionInfo-r11 SEQUENCE {

preambleTransMax-r11 PreambleTransMax

},

...

}

RACH-CE-LevelInfoList-r13 ::= SEQUENCE (SIZE (1..maxCE-Level-r13)) OF RACH-CE-LevelInfo-r13

RACH-CE-LevelInfo-r13 ::= SEQUENCE {

preambleMappingInfo-r13 SEQUENCE {

firstPreamble-r13 INTEGER(0..63),

lastPreamble-r13 INTEGER(0..63)

},

ra-ResponseWindowSize-r13 ENUMERATED {sf20, sf50, sf80, sf120, sf180,

sf240, sf320, sf400},

mac-ContentionResolutionTimer-r13 ENUMERATED {sf80, sf100, sf120,

sf160, sf200, sf240, sf480, sf960},

rar-HoppingConfig-r13 ENUMERATED {on,off},

...,

[[ edt-Parameters-r15 SEQUENCE {

edt-LastPreamble-r15 INTEGER(0..63),

edt-SmallTBS-Enabled-r15 BOOLEAN,

edt-TBS-r15 ENUMERATED {b328, b408, b504, b600, b712,

b808, b936, b1000or456},

mac-ContentionResolutionTimer-r15 ENUMERATED {sf240, sf480, sf960,

sf1920, sf3840, sf5760, sf7680, sf10240} OPTIONAL -- Need OP

} OPTIONAL -- Cond EDT

]]

}

PowerRampingParameters ::= SEQUENCE {

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

preambleInitialReceivedTargetPower ENUMERATED {

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

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

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

dBm-92, dBm-90}

}

PreambleTransMax ::= ENUMERATED {

n3, n4, n5, n6, n7, n8, n10, n20, n50,

n100, n200}

-- ASN1STOP

| RACH-ConfigCommon field descriptions |
| --- |
| ***connEstFailCount***  Number of times that the UE detects T300 expiry on the same cell before applying *connEstFailOffset*. |
| ***connEstFailOffset***  Parameter "Qoffsettemp" in TS 36.304 [4]. If the field is not present the value of infinity shall be used for "Qoffsettemp". |
| ***connEstFailOffsetValidity***  Amount of time that the UE applies *connEstFailOffset* before removing the offsetfrom evaluation of the cell. Value s30 corresponds to 30 seconds, s60 corresponds to 60 seconds, and so on. |
| ***edt-LastPreamble***  Provides the mapping of preambles to groups for each CE level for EDT, as specified in TS 36.321 [6]. For the concerned CE level, if PRACH resources configured by *edt-PRACH-ParametersCE-r15* are different from the PRACH resources configured by *PRACH-ParametersCE-r13* for all CE levels and *edt-PRACH-ParametersCE-r15* for all other CE levels, the preambles for EDT are the preambles *firstPreamble-r13* *to edt-LastPreamble-r15*, otherwise the preambles for EDT are the preambles *lastPreamble-r13* +1 to *edt-LastPreamble-r15*. |
| ***edt-SmallTBS-Enabled***  Value TRUE indicates UE performing EDT is allowed to select TBS smaller than *edt-TBS* for Msg3 in the corresponding CE level, as specified in TS 36.213 [23]. |
| ***edt-SmallTBS-Subset***  Presence indicates only two of the TBS values can be used according to *edt-TBS* corresponding to the CE level, as specified in TS 36.213 [23]. When the field is not present, any of the TBS values according to *edt-TBS* corresponding to the CE level can be used. This field is applicable for a CE level only when *edt-SmallTBS-Enabled* is included for the corresponding CE level. |
| ***edt-TBS***  Largest TBS for Msg3 for a CE level applicable to a UE performing EDT. Value in bits. Value b328 corresponds to 328 bits, b408 corresponds to 408 bits and so on. Additionally, value b1000or456 corresponds to 1000 bits for CE levels 0 and 1, and 456 bits for CE levels 2 and 3. See TS 36.213 [23]. |
| ***mac-ContentionResolutionTimer***  Timer for contention resolution in TS 36.321 [6]. Value in subframes. Value sf8 corresponds to 8 subframes, sf16 corresponds to 16 subframes and so on. *mac-ContentionResolutionTimer-r15* is only applicable for EDT. UE performing EDT shall use *mac-ContentionResolutionTimer-r15*, if present. |
| ***maxHARQ-Msg3Tx***  Maximum number of Msg3 HARQ transmissionsin TS 36.321 [6], used for contention based random access. Value is an integer. |
| ***messagePowerOffsetGroupB***  Threshold for preamble selection in TS 36.321 [6]. Value in dB. Value minusinfinity corresponds to –infinity. Value dB0 corresponds to 0 dB, dB5 corresponds to 5 dB and so on. |
| ***messageSizeGroupA***  Threshold for preamble selection in TS 36.321 [6]. Value in bits. Value b56 corresponds to 56 bits, b144 corresponds to 144 bits and so on. |
| ***numberOfRA-Preambles***  Number of non-dedicated random access preambles in TS 36.321 [6]. Value is an integer. Value n4 corresponds to 4, n8 corresponds to 8 and so on. |
| ***powerRampingStep***  Power ramping factor in TS 36.321 [6]. Value in dB. Value dB0 corresponds to 0 dB, dB2 corresponds to 2 dB and so on. |
| ***preambleInitialReceivedTargetPower***  Initial preamble power in TS 36.321 [6]. Value in dBm. Value dBm-120 corresponds to -120 dBm, dBm-118 corresponds to -118 dBm and so on. |
| ***preambleMappingInfo***  Provides the mapping of preambles to groups for each CE level, except for EDT, as specified in TS 36.321 [6]. When random access preambles group B is used, *firstPreamble-r13* is set to 0 and *lastPreamble-r13* is set to *numberOfRA-Preambles*-1. |
| ***preamblesGroupAConfig***  Provides the configuration for preamble grouping in TS 36.321 [6]. If the field is not signalled, the size of the random access preambles group A, as specified in TS 36.321 [6], is equal to *numberOfRA-Preambles*. |
| ***preambleTransMax, preambleTransMax-CE***  Maximum number of preamble transmission in TS 36.321 [6]. Value is an integer. Value n3 corresponds to 3, n4 corresponds to 4 and so on. |
| ***rach-CE-LevelInfoList***  Provides RACH information for each coverage level. The first entry in the list contains RACH information of CE level 0, the second entry in the list contains RACH information of CE level 1, and so on. If E-UTRAN includes *rach-CE-LevelInfoList,* it includes the same number of entries as in *prach-ParametersListCE.* |
| ***ra-ResponseWindowSize***  Duration of the RA response window in TS 36.321 [6]. Value in subframes. Value sf2 corresponds to 2 subframes, sf3 corresponds to 3 subframes and so on. The same value applies for each serving cell (although the associated functionality is performed independently for each cell). |
| ***rar-HoppingConfig***  Frequency hopping activation/deactivation for RAR/Msg3/Msg4 for a CE level, see TS 36.211 [21]. |
| ***sizeOfRA-PreamblesGroupA***  Size of the random access preambles group A in TS 36.321 [6]. Value is an integer. Value n4 corresponds to 4, n8 corresponds to 8 and so on. |

| Conditional presence | Explanation |
| --- | --- |
| *EDT* | The field is mandatory present if *cp-EDT* or *up-EDT* in *SystemInformationBlockType2* is present; otherwise the field is not present and the UE shall delete any existing value for this field. |
| *EDT-OR* | The field is optionally present, Need OR, if *cp-EDT* or *up-EDT* in *SystemInformationBlockType2* is present; otherwise the field is not present and the UE shall delete any existing value for this field. |

#### – *RACH-ConfigDedicated*

The IE *RACH-ConfigDedicated* is used to specify the dedicated random access parameters.

*RACH-ConfigDedicated* information element

-- ASN1START

RACH-ConfigDedicated ::= SEQUENCE {

ra-PreambleIndex INTEGER (0..63),

ra-PRACH-MaskIndex INTEGER (0..15)

}

-- ASN1STOP

| RACH-ConfigDedicated field descriptions |
| --- |
| ***ra-PRACH-MaskIndex***  Explicitly signalled PRACH Mask Index for RA Resource selection in TS 36.321 [6]. |
| ***ra-PreambleIndex***  Explicitly signalled Random Access Preamble for RA Resource selection in TS 36.321 [6]. |

#### – *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

]],

[[

wus-Config-v1610 WUS-Config-v1610 OPTIONAL, -- Need OR

highSpeedConfig-v1610 HighSpeedConfig-v1610 OPTIONAL, -- Need OR

crs-ChEstMPDCCH-ConfigCommon-r16 CRS-ChEstMPDCCH-ConfigCommon-r16 OPTIONAL, -- Need OR

gwus-Config-r16 GWUS-Config-r16 OPTIONAL, -- Need OR

uplinkPowerControlCommon-v1610 UplinkPowerControlCommon-v1610 OPTIONAL, -- Need OR

rss-MeasConfig-r16 ENUMERATED {enabled} OPTIONAL, -- Need OR

rss-MeasNonNCL-r16 ENUMERATED {enabled} OPTIONAL, -- Need OR

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

highSpeedInterRAT-NR-r16 BOOLEAN OPTIONAL -- Need OR

]],

[[

pcch-Config-v1700 PCCH-Config-v1700 OPTIONAL, -- Need OR

ntn-ConfigCommon-r17 SEQUENCE {

ta-Report-r17 ENUMERATED {enabled} OPTIONAL, -- Need OR

t318-r17 ENUMERATED {

ms0, ms50, ms100, ms200,

ms500, ms1000, ms2000, ms4000},

prach-TxDuration-r17 PRACH-TxDuration-r17 OPTIONAL, -- Need OR

pucch-TxDuration-r17 PUCCH-TxDuration-r17 OPTIONAL, -- Need OR

pusch-TxDuration-r17 PUSCH-TxDuration-r17 OPTIONAL -- Need OR

} 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-v1610 HighSpeedConfig-v1610 OPTIONAL, -- Need OR

uplinkPowerControlCommon-v1610 UplinkPowerControlCommon-v1610 OPTIONAL, -- Need OR

highSpeedInterRAT-NR-r16 BOOLEAN OPTIONAL -- Need ON

]],

[[ ntn-ConfigCommon-r17 SEQUENCE {

ta-Report-r17 ENUMERATED {enabled} OPTIONAL, -- Need OR

t318-r17 ENUMERATED {

ms0, ms50, ms100, ms200, ms500,

ms1000, ms2000, ms4000, ms6000},

prach-TxDuration-r17 PRACH-TxDuration-r17 OPTIONAL, -- Need OR

pucch-TxDuration-r17 PUCCH-TxDuration-r17 OPTIONAL, -- Need OR

pusch-TxDuration-r17 PUSCH-TxDuration-r17 OPTIONAL -- Need OR

} 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

]],

[[ highSpeedEnhMeasFlagSCell-r16 BOOLEAN OPTIONAL -- Need ON

]]

}

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

}

PCCH-Config-v1700 ::= SEQUENCE {

ranPagingInIdlePO-r17 ENUMERATED {true}

}

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-v1610 ::= SEQUENCE {

highSpeedEnhMeasFlag2-r16 ENUMERATED {true} OPTIONAL, -- Need OR

highSpeedEnhDemodFlag2-r16 ENUMERATED {true} OPTIONAL -- Need OR

}

-- 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. |
| ***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 configured with value TRUE, the UE shall apply the high speed (350 km/h) SCell measurement enhancements as specified in TS 36.133 [16]. |
| ***highSpeedInterRAT-NR***  If the field is present, the UE shall apply the enhanced inter-RAT NR measurement requirements to support high speed up to 500 km/h 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. This field is ignored by IAB-MT. The IAB-MT applies output power and emissions requirements, as specified in TS 38.174 [107] |
| ***prach-ConfigSCell***  Indicates a PRACH configuration for an SCell. 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]. |
| ***rach-ConfigCommonSCell***  Indicates a RACH configuration for an SCell. The field is not applicable for an LAA SCell in this release. |
| ***ranPagingInIdlePO***  Indicates that the network supports to send RAN paging in PO that corresponds to the i\_s determined by UE in RRC\_IDLE state, see TS 36.304 [4]. |
| ***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. |
| ***ta-Report***  Indicates whether UE specific TA reporting is enabled as specified in TS 36.321 [6]. |
| ***t318***  The value of timer T318. Value *ms0* corresponds with 0 ms, *ms50* corresponds with 50 ms and so on. |
| ***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 NULL,

crs-IntfMitigNumPRBs 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

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

]]

}

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

]],

[[ rlc-Config-v1700 RLC-Config-v1700 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 DAPS

]],

[[ rlc-Config-v1700 RLC-Config-v1700 OPTIONAL -- Need ON

]]

}

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-r15 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. 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 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 if sidelink is configured. |
| ***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. |
| ***newUE-Identity***  C-RNTI used after moving to RRC\_CONNECTED in response to transmission using PUR. |
| ***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 *RRCConnectionResume*); otherwise the field is optionally present, need ON. Upon connection establishment/ re-establishment only SRB1 is applicable (excluding *RRCConnectionResume*). |
| *HO-toEUTRA* | The field is mandatory present  - in case of handover to E-UTRA with the configuration for at least one MCG RLC bearer; 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 *RRCConnectionResume*); 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. |
| *DAPS* | This field is optionally present, Need ON,  - in case of handover within E-UTRA when the *fullConfig* and the *rach-Skip* are not included in the *RRCConnectionReconfiguration* message; and  - when the *uplinkDataCompression* and the *ethernetHeaderCompression* are not configured for the DRB; and  - when SCell(s) and SCG are not configured; and  - when the *conditionalReconfiguration* for CHO is not configured; and  - when the *RRCConnectionReconfiguration* message is not included in a *conditionalReconfiguration*.  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. |

#### – *RCLWI-Configuration*

The IE *RCLWI-Configuration* is used to add, modify or release the RCLWI configuration.

-- ASN1START

RCLWI-Configuration-r13 ::= CHOICE {

release NULL,

setup SEQUENCE {

rclwi-Config-r13 RCLWI-Config-r13

}

}

RCLWI-Config-r13 ::= SEQUENCE {

command CHOICE {

steerToWLAN-r13 SEQUENCE {

mobilityConfig-r13 WLAN-Id-List-r12

},

steerToLTE-r13 NULL

},

...

}

-- ASN1STOP

#### – *ResourceReservationConfig*

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

*ResourceReservationConfig* information element

-- ASN1START

ResourceReservationConfigDL-r16 ::= SEQUENCE {

periodicityStartPos-r16 PeriodicityStartPos-r16,

resourceReservationFreq-r16 CHOICE {

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

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

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

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

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

rbg-Bitmap20 BIT STRING (SIZE (25))

} OPTIONAL, -- Need OP

slotBitmap-r16 CHOICE {

slotPattern10ms BIT STRING (SIZE (20)),

slotPattern40ms BIT STRING (SIZE (80))

},

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

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

...

}

ResourceReservationConfigUL-r16 ::= SEQUENCE {

periodicityStartPos-r16 PeriodicityStartPos-r16,

slotBitmap-r16 CHOICE {

slotPattern10ms BIT STRING (SIZE (20)),

slotPattern40ms BIT STRING (SIZE (80))

} OPTIONAL, -- Cond FDDandTDDnoDL

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

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

...

}

PeriodicityStartPos-r16 ::= CHOICE {

periodicity10ms NULL,

periodicity20ms INTEGER(0..1),

periodicity40ms INTEGER(0..3),

periodicity80ms INTEGER(0..7),

periodicity160ms INTEGER(0..15),

spare3 NULL, spare2 NULL, spare1 NULL

}

-- ASN1STOP

| *ResourceReservationConfig* field descriptions |
| --- |
| ***periodicityStartPos***  Indicates periodicity and start offset of the reserved resources. Value set to *periodicity10ms* corresponds to periodicity 10 milliseconds and corresponding start position is 0, value set to *periodicity20ms* corresponds to periodicity 20 milliseconds and corresponding start position in milliseconds = indicated value \* 10ms, and so on. |
| ***resourceReservationFreq***  Downlink frequency domain resource reservation bitmap where each bit corresponds to a resource block group (RBG), see TS 36.213 [23]. Value *rbg-Bitmap1dot4* corresponds to 1.4 MHz system bandwidth, value *rbg-Bitmap3* corresponds to 3 MHz system bandwidth, and so on. If the field is absent, all RBGs in the system bandwidth are reserved. |
| ***slotBitmap***  Slot-level resource reservation configuration. Value *slotPattern10ms* corresponds to 10ms slot pattern and *slotPattern40ms* corresponds to 40ms slot pattern, see TS 36.213 [23] for DL and TS 36.211 [21] for UL.  The first/leftmost 2-bits corresponds to the subframe #0 of the radio frame satisfying SFN mod periodicity = start position, as indicated by *periopdicityStartPos*. Two bits for each subframe coded as:  00: both slots are not 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.  For a UE that supports subframe-level resource reservation but does not support slot/symbol-level resource reservation, two bits for each subframe are interpreted as:  00: subframe is not reserved  01: subframe is reserved. E-UTRAN does not set the field to this value when included in dedicated signalling.  10: subframe is reserved. E-UTRAN does not set the field to this value when included in dedicated signalling.  11: subframe is reserved.  If the field is not included in UL configuration, the value of the field from DL configuration applies. |
| ***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.  A UE that supports subframe-level resource reservation but does not support slot/symbol-level resource reservation shall ignore *symbolBitmap1* and *symbolBitmap2*, if present. |

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

#### – *RLC-Config*

The IE *RLC-Config* is used to specify the RLC configuration of SRBs and DRBs.

*RLC-Config* information element

-- ASN1START

RLC-Config ::= CHOICE {

am SEQUENCE {

ul-AM-RLC UL-AM-RLC,

dl-AM-RLC DL-AM-RLC

},

um-Bi-Directional SEQUENCE {

ul-UM-RLC UL-UM-RLC,

dl-UM-RLC DL-UM-RLC

},

um-Uni-Directional-UL SEQUENCE {

ul-UM-RLC UL-UM-RLC

},

um-Uni-Directional-DL SEQUENCE {

dl-UM-RLC DL-UM-RLC

},

...

}

RLC-Config-v1250 ::= SEQUENCE {

ul-extended-RLC-LI-Field-r12 BOOLEAN,

dl-extended-RLC-LI-Field-r12 BOOLEAN

}

RLC-Config-v1310 ::= SEQUENCE {

ul-extended-RLC-AM-SN-r13 BOOLEAN,

dl-extended-RLC-AM-SN-r13 BOOLEAN,

pollPDU-v1310 PollPDU-v1310 OPTIONAL -- Need OR

}

RLC-Config-v1430 ::= CHOICE {

release NULL,

setup SEQUENCE {

pollByte-r14 PollByte-r14

}

}

RLC-Config-v1510 ::= SEQUENCE {

reestablishRLC-r15 ENUMERATED {true}

}

RLC-Config-v1530 ::= CHOICE {

release NULL,

setup SEQUENCE {

rlc-OutOfOrderDelivery-r15 ENUMERATED {true}

}

}

RLC-Config-v1700 ::= SEQUENCE {

t-ReorderingExt-r17 SetupRelease {T-ReorderingExt-r17}

}

RLC-Config-r15 ::= SEQUENCE {

mode-r15 CHOICE {

am-r15 SEQUENCE {

ul-AM-RLC-r15 UL-AM-RLC-r15,

dl-AM-RLC-r15 DL-AM-RLC-r15

},

um-Bi-Directional-r15 SEQUENCE {

ul-UM-RLC-r15 UL-UM-RLC,

dl-UM-RLC-r15 DL-UM-RLC-r15

},

um-Uni-Directional-UL-r15 SEQUENCE {

ul-UM-RLC-r15 UL-UM-RLC

},

um-Uni-Directional-DL-r15 SEQUENCE {

dl-UM-RLC-r15 DL-UM-RLC-r15

}

},

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

rlc-OutOfOrderDelivery-r15 ENUMERATED {true} OPTIONAL, -- Need ON

...

}

UL-AM-RLC ::= SEQUENCE {

t-PollRetransmit T-PollRetransmit,

pollPDU PollPDU,

pollByte PollByte,

maxRetxThreshold ENUMERATED {

t1, t2, t3, t4, t6, t8, t16, t32}

}

UL-AM-RLC-r15 ::= SEQUENCE {

t-PollRetransmit-r15 T-PollRetransmit,

pollPDU-r15 PollPDU-r15,

pollByte-r15 PollByte-r14,

maxRetxThreshold-r15 ENUMERATED {

t1, t2, t3, t4, t6, t8, t16, t32},

extended-RLC-LI-Field-r15 BOOLEAN

}

DL-AM-RLC ::= SEQUENCE {

t-Reordering T-Reordering,

t-StatusProhibit T-StatusProhibit

}

DL-AM-RLC-r15 ::= SEQUENCE {

t-Reordering-r15 T-Reordering,

t-StatusProhibit-r15 T-StatusProhibit,

extended-RLC-LI-Field-r15 BOOLEAN

}

UL-UM-RLC ::= SEQUENCE {

sn-FieldLength SN-FieldLength

}

DL-UM-RLC ::= SEQUENCE {

sn-FieldLength SN-FieldLength,

t-Reordering T-Reordering

}

DL-UM-RLC-r15 ::= SEQUENCE {

sn-FieldLength-r15 SN-FieldLength-r15,

t-Reordering-r15 T-Reordering

}

SN-FieldLength ::= ENUMERATED {size5, size10}

SN-FieldLength-r15 ::= ENUMERATED {size5, size10, size16-r15}

T-PollRetransmit ::= ENUMERATED {

ms5, ms10, ms15, ms20, ms25, ms30, ms35,

ms40, ms45, ms50, ms55, ms60, ms65, ms70,

ms75, ms80, ms85, ms90, ms95, ms100, ms105,

ms110, ms115, ms120, ms125, ms130, ms135,

ms140, ms145, ms150, ms155, ms160, ms165,

ms170, ms175, ms180, ms185, ms190, ms195,

ms200, ms205, ms210, ms215, ms220, ms225,

ms230, ms235, ms240, ms245, ms250, ms300,

ms350, ms400, ms450, ms500, ms800-v1310,

ms1000-v1310, ms2000-v1310, ms4000-v1310,

spare5, spare4, spare3, spare2, spare1}

PollPDU ::= ENUMERATED {

p4, p8, p16, p32, p64, p128, p256, pInfinity}

PollPDU-v1310 ::= ENUMERATED {

p512, p1024, p2048, p4096, p6144, p8192, p12288, p16384}

PollPDU-r15 ::= ENUMERATED {

p4, p8, p16, p32, p64, p128, p256, p512, p1024,

p2048-r15, p4096-r15, p6144-r15, p8192-r15,

p12288-r15, p16384-r15, pInfinity}

PollByte ::= ENUMERATED {

kB25, kB50, kB75, kB100, kB125, kB250, kB375,

kB500, kB750, kB1000, kB1250, kB1500, kB2000,

kB3000, kBinfinity, spare1}

PollByte-r14 ::= ENUMERATED {

kB1, kB2, kB5, kB8, kB10, kB15, kB3500,

kB4000, kB4500, kB5000, kB5500, kB6000, kB6500,

kB7000, kB7500, kB8000, kB9000, kB10000, kB11000, kB12000,

kB13000, kB14000, kB15000, kB16000, kB17000, kB18000,

kB19000, kB20000, kB25000, kB30000, kB35000, kB40000}

T-Reordering ::= ENUMERATED {

ms0, ms5, ms10, ms15, ms20, ms25, ms30, ms35,

ms40, ms45, ms50, ms55, ms60, ms65, ms70,

ms75, ms80, ms85, ms90, ms95, ms100, ms110,

ms120, ms130, ms140, ms150, ms160, ms170,

ms180, ms190, ms200, ms1600-v1310}

T-ReorderingExt-r17 ::= ENUMERATED {ms2200, ms3200}

T-StatusProhibit ::= ENUMERATED {

ms0, ms5, ms10, ms15, ms20, ms25, ms30, ms35,

ms40, ms45, ms50, ms55, ms60, ms65, ms70,

ms75, ms80, ms85, ms90, ms95, ms100, ms105,

ms110, ms115, ms120, ms125, ms130, ms135,

ms140, ms145, ms150, ms155, ms160, ms165,

ms170, ms175, ms180, ms185, ms190, ms195,

ms200, ms205, ms210, ms215, ms220, ms225,

ms230, ms235, ms240, ms245, ms250, ms300,

ms350, ms400, ms450, ms500, ms800-v1310,

ms1000-v1310, ms1200-v1310, ms1600-v1310, ms2000-v1310, ms2400-v1310, spare2,

spare1}

-- ASN1STOP

| *RLC-Config* field descriptions |
| --- |
| ***dl-extended-RLC-LI-Field, ul-extended-RLC-LI-Field***  Indicates the RLC LI field size. Value *TRUE* means that 15 bit LI length shall be used, otherwise 11 bit LI length shall be used; see TS 36.322 [7]. E-UTRAN enables this field only when *RLC-Config* (without suffix) is set to *am.* |
| ***maxRetxThreshold***  Parameter for RLC AM in TS 36.322 [7]. Value t1 corresponds to 1 retransmission, t2 to 2 retransmissions and so on. |
| ***reestablishRLC***  Indicates that RLC shall be re-established. For a UE configured with (NG)EN-DC, E-UTRAN may include this field for the (primary) RLC entity of an MCG RLC bearer of a DRB (used upon change from SN terminated split to MN terminated MCG RLC bearer). For a UE configured with NE-DC, E-UTRAN may include this field for the (primary) RLC entity of an SCG RLC bearer of a DRB or of an SRB (used upon key refresh for MN terminated split RB). |
| ***pollByte***  Parameter for RLC AM in TS 36.322 [7]. Value kB25 corresponds to 25 kBytes, kB50 to 50 kBytes and so on. kBInfinity corresponds to an infinite amount of kBytes. In case *pollByte-r14* is signalled, the UE shall ignore pollByte (i.e. without suffix). |
| ***pollPDU***  Parameter for RLC AM in TS 36.322 [7]. Value p4 corresponds to 4 PDUs, p8 to 8 PDUs and so on. pInfinity corresponds to an infinite number of PDUs. In case *pollPDU-r13* is signalled, the UE shall ignore *pollPDU* (i.e. without suffix). E-UTRAN enables *pollPDU-v1310* field only when *RLC-Config* (without suffix) is set to *am.* |
| ***rlc-OutOfOrderDelivery***  Indicates that out-of-order delivery from RLC to PDCP is configured for this RLC entity as specified in TS 36.322 [7]. |
| ***sn-FieldLength***  Indicates the UM RLC SN field size, see TS 36.322 [7], in bits. Value size5 means 5 bits, size10 means 10 bits. |
| ***t-PollRetransmit***  Timer for RLC AM inTS 36.322 [7], in milliseconds. Value ms5 means 5ms, ms10 means 10ms and so on. EUTRAN configures values msX-v1310 (with suffix) only if UE supports CE. |
| ***t-Reordering***  Timer for reordering in TS 36.322 [7], in milliseconds. Value ms0 means 0ms and behaviour as specified in 7.3.2 applies, ms5 means 5ms and so on. |
| ***t-ReorderingExt***  Timer for reordering in TS 36.322 [7], in milliseconds. Value *ms2200* corresponds to 2200 ms, value *ms3200* corresponds to 3200 ms.  The UE shall use the extended value *t-ReorderingExt-r17*, if present, and ignore the value signaled by *t-Reordering* or *t-Reordering-r15*. |
| ***t-StatusProhibit***  Timer for status reporting in TS 36.322 [7], in milliseconds. Value ms0 means 0ms and behaviour as specified in 7.3.2 applies, ms5 means 5ms and so on. EUTRAN configures values msX-v1310 (with suffix) only if UE supports operation in CE. |
| ***ul-extended-RLC-AM-SN, dl-extended-RLC-AM-SN***  Indicates whether or not the UE shall use the extended SN and SO length for AM bearer. Value *TRUE* means that 16 bit SN length and 16 bit SO length shall be used, otherwise 10 bit SN length and 15 bit SO length shall be used; see TS 36.322 [7]. |

#### – *RLF-TimersAndConstants*

The IE *RLF-TimersAndConstants* contains UE specific timers and constants applicable for UEs in RRC\_CONNECTED.

*RLF-TimersAndConstants* information element

-- ASN1START

RLF-TimersAndConstants-r9 ::= CHOICE {

release NULL,

setup SEQUENCE {

t301-r9 ENUMERATED {

ms100, ms200, ms300, ms400, ms600, ms1000, ms1500,

ms2000},

t310-r9 ENUMERATED {

ms0, ms50, ms100, ms200, ms500, ms1000, ms2000},

n310-r9 ENUMERATED {

n1, n2, n3, n4, n6, n8, n10, n20},

t311-r9 ENUMERATED {

ms1000, ms3000, ms5000, ms10000, ms15000,

ms20000, ms30000},

n311-r9 ENUMERATED {

n1, n2, n3, n4, n5, n6, n8, n10},

...

}

}

RLF-TimersAndConstants-r13 ::= CHOICE {

release NULL,

setup SEQUENCE {

t301-v1310 ENUMERATED {

ms2500, ms3000, ms3500, ms4000, ms5000,

ms6000, ms8000, ms10000},

...,

[[ t310-v1330 ENUMERATED {ms4000, ms6000} OPTIONAL -- Need ON

]]

}

}

RLF-TimersAndConstantsSCG-r12 ::= CHOICE {

release NULL,

setup SEQUENCE {

t313-r12 ENUMERATED {

ms0, ms50, ms100, ms200, ms500, ms1000, ms2000},

n313-r12 ENUMERATED {

n1, n2, n3, n4, n6, n8, n10, n20},

n314-r12 ENUMERATED {

n1, n2, n3, n4, n5, n6, n8, n10},

...

}

}

RLF-TimersAndConstantsMCG-Failure-r16 ::= CHOICE {

release NULL,

setup SEQUENCE {

t316-r16 ENUMERATED {ms50, ms100, ms200, ms300, ms400,

ms500, ms600, ms1000, ms1500, ms2000},

...

}

}

-- ASN1STOP

| *RLF-TimersAndConstants* field descriptions |
| --- |
| ***n3xy***  Constants are described in clause 7.4. n1 corresponds with 1, n2 corresponds with 2 and so on. |
| ***t3xy***  Timers are described in clause 7.3. Value ms0 corresponds with 0 ms, ms50 corresponds with 50 ms and so on.  E-UTRAN configures *RLF-TimersAndConstants-r13* only if UE supports *ce-ModeB*. UE shall use the extended values *t3xy-v1310* and *t3xy-v1330*, if present, and ignore the values signaled by *t3xy-r9*. |

#### – *RN-SubframeConfig*

The IE *RN-SubframeConfig* is used to specify the subframe configuration for an RN.

*RN-SubframeConfig* information element

-- ASN1START

RN-SubframeConfig-r10 ::= SEQUENCE {

subframeConfigPattern-r10 CHOICE {

subframeConfigPatternFDD-r10 BIT STRING (SIZE(8)),

subframeConfigPatternTDD-r10 INTEGER (0..31)

} OPTIONAL, -- Need ON

rpdcch-Config-r10 SEQUENCE {

resourceAllocationType-r10 ENUMERATED {type0, type1, type2Localized, type2Distributed,

spare4, spare3, spare2, spare1},

resourceBlockAssignment-r10 CHOICE {

type01-r10 CHOICE {

nrb6-r10 BIT STRING (SIZE(6)),

nrb15-r10 BIT STRING (SIZE(8)),

nrb25-r10 BIT STRING (SIZE(13)),

nrb50-r10 BIT STRING (SIZE(17)),

nrb75-r10 BIT STRING (SIZE(19)),

nrb100-r10 BIT STRING (SIZE(25))

},

type2-r10 CHOICE {

nrb6-r10 BIT STRING (SIZE(5)),

nrb15-r10 BIT STRING (SIZE(7)),

nrb25-r10 BIT STRING (SIZE(9)),

nrb50-r10 BIT STRING (SIZE(11)),

nrb75-r10 BIT STRING (SIZE(12)),

nrb100-r10 BIT STRING (SIZE(13))

},

...

},

demodulationRS-r10 CHOICE {

interleaving-r10 ENUMERATED {crs},

noInterleaving-r10 ENUMERATED {crs, dmrs}

},

pdsch-Start-r10 INTEGER (1..3),

pucch-Config-r10 CHOICE {

tdd CHOICE {

channelSelectionMultiplexingBundling SEQUENCE {

n1PUCCH-AN-List-r10 SEQUENCE (SIZE (1..4)) OF INTEGER (0..2047)

},

fallbackForFormat3 SEQUENCE {

n1PUCCH-AN-P0-r10 INTEGER (0..2047),

n1PUCCH-AN-P1-r10 INTEGER (0..2047) OPTIONAL -- Need OR

}

},

fdd SEQUENCE {

n1PUCCH-AN-P0-r10 INTEGER (0..2047),

n1PUCCH-AN-P1-r10 INTEGER (0..2047) OPTIONAL -- Need OR

}

},

...

} OPTIONAL, -- Need ON

...

}

-- ASN1STOP

|  |
| --- |
| *RN-SubframeConfig* field descriptions |
| ***demodulationRS***  Indicates which reference signals are used for R-PDCCH demodulation according to TS 36.216 [55], clause 7.4.1. Value interleaving corresponds to cross-interleaving and value noInterleaving corresponds to no cross-interleaving according to TS 36.216 [55], clauses 7.4.2 and 7.4.3. |
| ***n1PUCCH-AN-List***  Parameter: , see TS 36.216, [55], clause 7.5.1. This parameter is only applicable for TDD. Configures PUCCH HARQ-ACK resources if the RN is configured to use HARQ-ACK channel selection, HARQ-ACK multiplexing or HARQ-ACK bundling. |
| ***n1PUCCH-AN-P0, n1PUCCH-AN-P1***  Parameter: , for antenna port P0 and for antenna port P1 respectively, see TS 36.216, [55], clause 7.5.1, for FDD and [55], clause 7.5.2 for TDD. |
| ***pdsch-Start***  Parameter: *DL-StartSymbol*,see TS 36.216 [55], Table 5.4-1. |
| ***resourceAllocationType***  Represents the resource allocation used: type 0, type 1 or type 2 according to TS 36.213 [23], clause 7.1.6. Value type0 corresponds to type 0, value type1 corresponds to type 1, value type2Localized corresponds to type 2 with localized virtual resource blocks and type2Distributed corresponds to type 2 with distributed virtual resource blocks. |
| ***resourceBlockAssignment***  Indicates the resource block assignment bits according to TS 36.213 [23], clause 7.1.6. Value type01 corresponds to type 0 and type 1, and the value type2 corresponds to type 2. Value nrb6 corresponds to a downlink system bandwidth of 6 resource blocks, value nrb15 corresponds to a downlink system bandwidth of 15 resource blocks, and so on. |
| ***subframeConfigPatternFDD***  Parameter: *SubframeConfigurationFDD*, see TS 36.216 [55], Table 5.2-1. Defines the DL subframe configuration for eNB-to-RN transmission, i.e. those subframes in which the eNB may indicate downlink assignments for the RN. The radio frame in which the pattern starts (i.e. the radio frame in which the first bit of the *subframeConfigPatternFDD* corresponds to subframe #0) occurs when SFN mod 4 = 0. |
| ***subframeConfigPatternTDD***  Parameter: *SubframeConfigurationTDD*, see TS 36.216 [55], Table 5.2-2. Defines the DL and UL subframe configuration for eNB-RN transmission. |

#### *– RSS-Config*

The IE *RSS-Config* is used to specify the RSS configuration, see TS 36.211 [21].

***RSS-Config* information element**

-- ASN1START

RSS-Config-r15 ::= SEQUENCE {

duration-r15 ENUMERATED {sf8, sf16, sf32, sf40},

freqLocation-r15 INTEGER (0..98),

periodicity-r15 ENUMERATED {ms160, ms320, ms640, ms1280},

powerBoost-r15 ENUMERATED {dB0, dB3, dB4dot8, dB6},

timeOffset-r15 INTEGER (0..31)

}

-- ASN1STOP

| *RSS-Config* field descriptions |
| --- |
| ***duration***  Duration of RSS in subframes. Value sf8 corresponds to 8 subframes, value sf16 corresponds to 16 subframes and so on. |
| ***freqLocation***  Frequency location (lowest PRB number) of RSS. |
| ***periodicity***  Periodicity of RSS. Value ms160 corresponds to 160 ms, value ms320 corresponds to 320 ms and so on. |
| ***powerBoost***  Power offset of RSS relative to CRS in dB. Value dB0 corresponds to 0 dB, value dB3 corresponds to 3 dB, value dB4dot8 corresponds to 4.8 dB and so on. |
| ***timeOffset***  Time offset of RSS in frames. The actual value of time offset is based on the value of *periodicity*, as follows:  For *periodicity* 160 ms, only value range 0 to 15 are applicable. Actual value = *timeOffset* \* 1 frame.  For *periodicity* 320 ms, actual value = *timeOffset* \* 1 frame.  For *periodicity* 640 ms, actual value = *timeOffset* \* 2 frames.  For *periodicity* 1280 ms, actual value = *timeOffset* \* 4 frames. |

#### – *SchedulingRequestConfig*

The IE *SchedulingRequestConfig* is used to specify the Scheduling Request related parameters

*SchedulingRequestConfig* information element

-- ASN1START

SchedulingRequestConfig ::= CHOICE {

release NULL,

setup SEQUENCE {

sr-PUCCH-ResourceIndex INTEGER (0..2047),

sr-ConfigIndex INTEGER (0..157),

dsr-TransMax ENUMERATED {

n4, n8, n16, n32, n64, spare3, spare2, spare1}

}

}

SchedulingRequestConfig-v1020 ::= SEQUENCE {

sr-PUCCH-ResourceIndexP1-r10 INTEGER (0..2047) OPTIONAL -- Need OR

}

SchedulingRequestConfigSCell-r13 ::= CHOICE {

release NULL,

setup SEQUENCE {

sr-PUCCH-ResourceIndex-r13 INTEGER (0..2047),

sr-PUCCH-ResourceIndexP1-r13 INTEGER (0..2047) OPTIONAL, -- Need OR

sr-ConfigIndex-r13 INTEGER (0..157),

dsr-TransMax-r13 ENUMERATED {

n4, n8, n16, n32, n64, spare3, spare2, spare1}

}

}

SchedulingRequestConfig-v1530 ::= CHOICE {

release NULL,

setup SEQUENCE {

sr-SlotSPUCCH-IndexFH-r15 INTEGER (0..1319) OPTIONAL, -- Need OR

sr-SlotSPUCCH-IndexNoFH-r15 INTEGER (0..3959) OPTIONAL, -- Need OR

sr-SubslotSPUCCH-ResourceList-r15 SR-SubslotSPUCCH-ResourceList-r15 OPTIONAL, -- Need OR

sr-ConfigIndexSlot-r15 INTEGER (0..36) OPTIONAL, -- Need OR

sr-ConfigIndexSubslot-r15 INTEGER (0..122) OPTIONAL, -- Need OR

dssr-TransMax-r15 ENUMERATED {

n4, n8, n16, n32, n64, spare3, spare2, spare1}

}

}

SR-SubslotSPUCCH-ResourceList-r15 ::= SEQUENCE (SIZE(1..4)) OF INTEGER (0..1319)

-- ASN1STOP

| *SchedulingRequestConfig* field descriptions |
| --- |
| ***dsr-TransMax***  Parameter for SR transmission in TS 36.321 [6], clause 5.4.4. The value n4 corresponds to 4 transmissions, n8 corresponds to 8 transmissions and so on. EUTRAN configures the same value for all serving cells for which this field is configured. |
| ***dssr-TransMax***  Parameter for SPUCCH SR transmission in TS 36.321 [6], clause 5.4.4. EUTRAN configures the same value for all serving cells for which this field is configured. |
| ***sr-ConfigIndex, sr-ConfigIndexSlot, sr-ConfigIndexSubslot***  Parameter. See TS 36.213 [23], clause 10.1. The values 156 and 157 are not applicable for Release 8. |
| ***sr-PUCCH-ResourceIndex, sr-PUCCH-ResourceIndexP1***  Parameter:  for antenna port P0 and for antenna port P1 respectively, see TS 36.213 [23], clause 10.1. E-UTRAN configures *sr-PUCCH-ResourceIndexP1* only if *sr-PUCCHResourceIndex* is configured. |
| ***sr-SlotSPUCCH-IndexFH***  Resource configuration for SR using slot-SPUCCH when frequency hopping is enabled, see TS 36.213 [23], clause 10.1.5. |
| ***sr-SlotSPUCCH-IndexNoFH***  Resource configuration for SR using slot-SPUCCH when frequency hopping is disabled, see TS 36.213 [23], clause 10.1.5. |
| ***sr-SubslotSPUCCH-ResourceList***  Resource configuration for SR using subslot-SPUCCH, see TS 36.213 [23], clause 10.1.5. |

#### – *SlotOrSubslotPDSCH-Config*

The IE *SlotOrSubslotPDSCH-Config* is used to specify the UE specific PDSCH configuration when sTTI is used.

*SlotOrSubslotPDSCH-Config* information element

-- ASN1START

SlotOrSubslotPDSCH-Config-r15 ::= CHOICE {

release NULL,

setup SEQUENCE {

altCQI-TableSTTI-r15 ENUMERATED {

allSubframes, csi-SubframeSet1,

csi-SubframeSet2, spare1} OPTIONAL, -- Need OR

altCQI-Table1024QAM-STTI-r15 ENUMERATED {

allSubframes, csi-SubframeSet1,

csi-SubframeSet2, spare1} OPTIONAL, -- Need OR

resourceAllocation-r15 ENUMERATED {

resourceAllocationType0,resourceAllocationType2} OPTIONAL, -- Need OR

tbsIndexAlt-STTI-r15 ENUMERATED {a33} OPTIONAL, -- Need OR

tbsIndexAlt2-STTI-r15 ENUMERATED {b33} OPTIONAL, -- Need OR

tbsIndexAlt3-STTI-r15 ENUMERATED {a37} OPTIONAL, -- Need OR

...

}

}

-- ASN1STOP

| *SlotOrSubslotPDSCH-Config* field descriptions |
| --- |
| ***altCQI-TableSTTI, altCQI-Table1024QAM-STTI***  Indicates the applicability of the alternative CQI table (i.e. Table 7.2.3-2 and Table 7.2.3-4 in TS 36.213 [23]) for aperiodic CSI reporting for slot or subslot PDSCH for the concerned serving cell. Value *allSubframes* means the alternative CQI table applies to all the subframes and CSI processes, if configured, and value *csi-SubframeSet1* means the alternative CQI table applies to CSI subframe set1, and value *csi-SubframeSet2* means the alternative CQI table applies to CSI subframe set2. EUTRAN sets the value to *csi-SubframeSet1* or *csi-SubframeSet2* only if transmissionMode is set in range *tm1* to *tm9* and csi-SubframePatternConfig-r10 is configured for the concerned serving cell and different CQI tables apply to the two CSI subframe sets; otherwise EUTRAN sets the value to *allSubframes*. EUTRAN does not configure the same value for altCQI-TableSTTI-r15 and altCQI-Table-1024QAM-STTI-r15 in SlotOrSubslotPDSCH-Config-r15. EUTRAN does not configure altCQI-Table-1024QAM-STTI-r15 if the value of altCQI-TableSTTI-r15 is set to *allSubframes*. EUTRAN does not configure altCQI-TableSTTI-r15 if the value of altCQI-Table-1024QAM-STTI-r15 is set to *allSubframes*. If both altCQI-TableSTTI-r15 and altCQI-Table-1024QAM-STTI-r15 are absent, the UE shall use Table 7.2.3-1 in TS 36.213 [23] for all subframes and CSI processes, if configured. |
| ***resourceAllocation***  Parameter indicates resource allocation type for slot-PDSCH or subslot-PDSCH. |
| ***tbsIndexAlt-STTI***  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 slots/subslots scheduled by DCI format 7-1F and 7-1G. Value a*33* refers to the alternative TBS index *I*TBS 33A. If neither this field nor *tbsIndexAlt2-STTI* 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 slots/subslots instead. |
| ***tbsIndexAlt2-STTI***  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 slots/subslots scheduled by DCI format 7-1B/7-1C/7-1D. Value *b33* refers to the alternative TBS index *I*TBS 33B. If neither this field nor *tbsIndexAlt-STTI* 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 slots/subslots instead. |
| ***tbsIndexAlt3-STTI***  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 slots/subslots scheduled by DCI format 7-1F/7-1G. Value *a37* refers to the alternative TBS index *I*TBS 37A. If this field does notconfigure an alternative TBS index for *I*TBS 37, the UE shall use *I*TBS 37 specified in TS 36.213 [23], Table 7.1.7.2.1-1 for all slots/subslots instead. |

#### – *SlotOrSubslotPUSCH-Config*

The IE *SlotOrSubslotPUSCH-Config* is used to specify the UE specific PUSCH configuration when sTTI is used.

*SlotOrSubslotPUSCH-Config* information element

-- ASN1START

SlotOrSubslotPUSCH-Config-r15 ::= CHOICE {

release NULL,

setup SEQUENCE {

betaOffsetSlot-ACK-Index-r15 INTEGER(0..15) OPTIONAL, -- Need OR

betaOffset2Slot-ACK-Index-r15 INTEGER(0..15) OPTIONAL, -- Need OR

betaOffsetSubslot-ACK-Index-r15 SEQUENCE (SIZE(1..2)) OF INTEGER(0..15) OPTIONAL, -- Need OR

betaOffset2Subslot-ACK-Index-r15 SEQUENCE (SIZE(1..2)) OF INTEGER(0..15) OPTIONAL, -- Need OR

betaOffsetSlot-RI-Index-r15 INTEGER(0..15) OPTIONAL, -- Need OR

betaOffsetSubslot-RI-Index-r15 SEQUENCE (SIZE(1..2)) OF INTEGER(0..15) OPTIONAL, -- Need OR

betaOffsetSlot-CQI-Index-r15 INTEGER(0..15) OPTIONAL, -- Need OR

betaOffsetSubslot-CQI-Index-r15 INTEGER(0..15) OPTIONAL, -- Need OR

enable256QAM-SlotOrSubslot-r15 Enable256QAM-r14 OPTIONAL, -- Need ON

resourceAllocationOffset-r15 INTEGER (1..2) OPTIONAL, -- Need OR

ul-DMRS-IFDMA-SlotOrSubslot-r15 BOOLEAN,

...

}

}

-- ASN1STOP

| *SlotOrSubslotPUSCH-Config* field descriptions |
| --- |
| ***betaOffsetSlot-ACK-Index, betaOffsetSubslot-ACK-Index, betaOffset2Slot-ACK-Index, betaOffset2Subslot-ACK-Index***  Parameter: and for single-codeword, see TS 36.213 [23], Table 8.6.3-1. If *betaOffset2Slot-ACK-Index/betaOffset2Subslot-ACK-Index* is configured; *betaOffsetSlot-ACK-Index/betaOffsetSubslot-ACK-Index* is used when up to 22 HARQ-ACK bits are transmitted otherwise *betaOffset2Slot-ACK-Index/betaOffset2Subslot-ACK-Index* is used. The values apply for all serving cells with an uplink in a cell group (MCG or SCG or the group of cells configured to send SPUCCH on the same cell in case SPUCCH SCell is configured) and not configured with uplink power control subframe sets. It is indicated in DCI format 7-0A/7-0B which of the two values taken by *betaOffsetSubslot-ACK-Index-r15/betaOffset2Subslot-ACK-Index-r15/* *betaOffsetSubslot-RI-Index-r15* to use. 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). |
| ***betaOffsetSlot-RI-Index, betaOffsetSubslot-RI-Index***  Parameter: , for single codeword, 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 SPUCCH on the same cell in case SPUCCH 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). |
| ***betaOffsetSlot-CQI-Index, betaOffsetSubslot-CQI-Index***  Parameter: , for single codeword, 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 SPUCCH on the same cell in case SPUCCH 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). |
| ***enable256QAM-SlotOrSubslot***  Indicates that 256QAM for slot or subslot is enabled, see TS 36.213 [23], clause 8.6.1. |
| ***resourceAllocationOffset***  Indicates an RB resource allocation offset of 1 or 2 PRBs for slot-PUSCH or subslot-PUSCH. When the field is absent, the UE assumes no offset is used (i.e. offset = 0). |
| ***ul-DMRS-IFDMA-SlotOrSubslot***  Value *TRUE* indicates that the UE is configured with enhanced UL DMRS. |

#### – *SoundingRS-UL-Config*

The IE *SoundingRS-UL-Config* is used to specify the uplink Sounding RS configuration for periodic and aperiodic sounding.

*SoundingRS-UL-Config* information element

-- ASN1START

SoundingRS-UL-ConfigCommon ::= CHOICE {

release NULL,

setup SEQUENCE {

srs-BandwidthConfig ENUMERATED {bw0, bw1, bw2, bw3, bw4, bw5, bw6, bw7},

srs-SubframeConfig ENUMERATED {

sc0, sc1, sc2, sc3, sc4, sc5, sc6, sc7,

sc8, sc9, sc10, sc11, sc12, sc13, sc14, sc15},

ackNackSRS-SimultaneousTransmission BOOLEAN,

srs-MaxUpPts ENUMERATED {true} OPTIONAL -- Cond TDD

}

}

SoundingRS-UL-ConfigDedicated ::= CHOICE{

release NULL,

setup SEQUENCE {

srs-Bandwidth ENUMERATED {bw0, bw1, bw2, bw3},

srs-HoppingBandwidth ENUMERATED {hbw0, hbw1, hbw2, hbw3},

freqDomainPosition INTEGER (0..23),

duration BOOLEAN,

srs-ConfigIndex INTEGER (0..1023),

transmissionComb INTEGER (0..1),

cyclicShift ENUMERATED {cs0, cs1, cs2, cs3, cs4, cs5, cs6, cs7}

}

}

SoundingRS-UL-ConfigDedicated-v1020 ::= SEQUENCE {

srs-AntennaPort-r10 SRS-AntennaPort

}

SoundingRS-UL-ConfigDedicated-v1310 ::= CHOICE{

release NULL,

setup SEQUENCE {

transmissionComb-v1310 INTEGER (2..3) OPTIONAL, -- Need OR

cyclicShift-v1310 ENUMERATED {cs8, cs9, cs10, cs11} OPTIONAL, -- Need OR

transmissionCombNum-r13 ENUMERATED {n2, n4} OPTIONAL -- Need OR

}

}

SoundingRS-UL-ConfigDedicatedUpPTsExt-r13 ::= CHOICE{

release NULL,

setup SEQUENCE {

srs-UpPtsAdd-r13 ENUMERATED {sym2, sym4},

srs-Bandwidth-r13 ENUMERATED {bw0, bw1, bw2, bw3},

srs-HoppingBandwidth-r13 ENUMERATED {hbw0, hbw1, hbw2, hbw3},

freqDomainPosition-r13 INTEGER (0..23),

duration-r13 BOOLEAN,

srs-ConfigIndex-r13 INTEGER (0..1023),

transmissionComb-r13 INTEGER (0..3),

cyclicShift-r13 ENUMERATED {cs0, cs1, cs2, cs3, cs4, cs5, cs6, cs7,

cs8, cs9, cs10, cs11},

srs-AntennaPort-r13 SRS-AntennaPort,

transmissionCombNum-r13 ENUMERATED {n2, n4}

}

}

SoundingRS-UL-ConfigDedicatedAperiodic-r10 ::= CHOICE{

release NULL,

setup SEQUENCE {

srs-ConfigIndexAp-r10 INTEGER (0..31),

srs-ConfigApDCI-Format4-r10 SEQUENCE (SIZE (1..3)) OF SRS-ConfigAp-r10 OPTIONAL,--Need ON

srs-ActivateAp-r10 CHOICE {

release NULL,

setup SEQUENCE {

srs-ConfigApDCI-Format0-r10 SRS-ConfigAp-r10,

srs-ConfigApDCI-Format1a2b2c-r10 SRS-ConfigAp-r10,

...

}

} OPTIONAL -- Need ON

}

}

SoundingRS-UL-ConfigDedicatedAperiodic-v1310 ::= CHOICE{

release NULL,

setup SEQUENCE {

srs-ConfigApDCI-Format4-v1310 SEQUENCE (SIZE (1..3)) OF SRS-ConfigAp-v1310 OPTIONAL,--Need ON

srs-ActivateAp-v1310 CHOICE {

release NULL,

setup SEQUENCE {

srs-ConfigApDCI-Format0-v1310 SRS-ConfigAp-v1310 OPTIONAL, -- Need ON

srs-ConfigApDCI-Format1a2b2c-v1310 SRS-ConfigAp-v1310 OPTIONAL -- Need ON

}

} OPTIONAL -- Need ON

}

}

SoundingRS-UL-ConfigDedicatedAperiodicUpPTsExt-r13 ::= CHOICE{

release NULL,

setup SEQUENCE {

srs-UpPtsAdd-r13 ENUMERATED {sym2, sym4},

srs-ConfigIndexAp-r13 INTEGER (0..31),

srs-ConfigApDCI-Format4-r13 SEQUENCE (SIZE (1..3)) OF SRS-ConfigAp-r13 OPTIONAL,--Need ON

srs-ActivateAp-r13 CHOICE {

release NULL,

setup SEQUENCE {

srs-ConfigApDCI-Format0-r13 SRS-ConfigAp-r13,

srs-ConfigApDCI-Format1a2b2c-r13 SRS-ConfigAp-r13

}

} OPTIONAL -- Need ON

}

}

SoundingRS-UL-ConfigDedicatedAperiodic-v1430 ::= CHOICE{

release NULL,

setup SEQUENCE {

srs-SubframeIndication-r14 INTEGER (1..4) OPTIONAL -- Need ON

}

}

SoundingRS-UL-ConfigDedicatedAdd-r16 ::= SEQUENCE {

srs-ConfigIndexAp-r16 INTEGER (0..31),

srs-ConfigApDCI-Format4-r16 SEQUENCE (SIZE (1..3)) OF SRS-ConfigAdd-r16

OPTIONAL, --Need ON

srs-ActivateAp-r13 CHOICE {

release NULL,

setup SEQUENCE {

srs-ConfigApDCI-Format0-r16 SRS-ConfigAdd-r16,

srs-ConfigApDCI-Format1a2b2c-r16 SRS-ConfigAdd-r16

}

} OPTIONAL --Need ON

}

SRS-ConfigAp-r10 ::= SEQUENCE {

srs-AntennaPortAp-r10 SRS-AntennaPort,

srs-BandwidthAp-r10 ENUMERATED {bw0, bw1, bw2, bw3},

freqDomainPositionAp-r10 INTEGER (0..23),

transmissionCombAp-r10 INTEGER (0..1),

cyclicShiftAp-r10 ENUMERATED {cs0, cs1, cs2, cs3, cs4, cs5, cs6, cs7}

}

SRS-ConfigAp-v1310 ::= SEQUENCE {

transmissionCombAp-v1310 INTEGER (2..3) OPTIONAL, -- Need OR

cyclicShiftAp-v1310 ENUMERATED {cs8, cs9, cs10, cs11} OPTIONAL, -- Need OR

transmissionCombNum-r13 ENUMERATED {n2, n4} OPTIONAL -- Need OR

}

SRS-ConfigAp-r13 ::= SEQUENCE {

srs-AntennaPortAp-r13 SRS-AntennaPort,

srs-BandwidthAp-r13 ENUMERATED {bw0, bw1, bw2, bw3},

freqDomainPositionAp-r13 INTEGER (0..23),

transmissionCombAp-r13 INTEGER (0..3),

cyclicShiftAp-r13 ENUMERATED {cs0, cs1, cs2, cs3, cs4, cs5, cs6, cs7,

cs8, cs9, cs10, cs11},

transmissionCombNum-r13 ENUMERATED {n2, n4}

}

SRS-AntennaPort ::= ENUMERATED {an1, an2, an4, spare1}

SRS-ConfigAdd-r16 ::= SEQUENCE {

srs-RepNumAdd-r16 ENUMERATED {n1, n2, n3, n4, n6, n7, n8, n9, n12, n13},

srs-BandwidthAdd-r16 ENUMERATED {bw0, bw1, bw2, bw3},

srs-HoppingBandwidthAdd-r16 ENUMERATED {hbw0, hbw1, hbw2, hbw3},

srs-FreqDomainPosAdd-r16 INTEGER (0..23),

srs-AntennaPortAdd-r16 SRS-AntennaPort,

srs-CyclicShiftAdd-r16 ENUMERATED {cs0, cs1, cs2, cs3, cs4, cs5, cs6, cs7,

cs8, cs9, cs10, cs11},

srs-TransmissionCombNumAdd-r16 ENUMERATED {n2, n4},

srs-TransmissionCombAdd-r16 INTEGER (0..3),

srs-StartPosAdd-r16 INTEGER (1..13),

srs-DurationAdd-r16 INTEGER (1..13),

srs-GuardSymbolAS-Add-r16 ENUMERATED {enabled} OPTIONAL, -- Need ON

srs-GuardSymbolFH-Add-r16 ENUMERATED {enabled} OPTIONAL -- Need ON

}

-- ASN1STOP

| *SoundingRS-UL-Config* field descriptions |
| --- |
| ***ackNackSRS-SimultaneousTransmission***  Parameter: *Simultaneous-AN-and-SRS*, see TS 36.213 [23], clause 8.2. For SCells without PUCCH configured, this field is not applicable and the UE shall ignore the value. |
| ***cyclicShift, cyclicShiftAp, srs-CyclicShiftAdd***  Parameter: n\_SRS for periodic, aperiodic and additional sounding reference signal transmission respectively except for an LAA SCell. See TS 36.211 [21], clause 5.5.3.1, where cs0 corresponds to 0 etc. |
| ***duration***  Parameter: Duration for periodic sounding reference signal transmission except for an LAA SCell. See TS 36.213 [21], clause 8.2. FALSE corresponds to "single" and value TRUE to "indefinite". |
| ***freqDomainPosition, freqDomainPositionAp, srs-FreqDomainPosAdd***  Parameter:  for periodic, aperiodic and additional sounding reference signal transmission respectively, see TS 36.211 [21], clause 5.5.3.2. |
| ***srs-AntennaPort, srs-AntennaPortAp, srs-AntennaPortAdd***  Indicates the number of antenna ports used for periodic, aperiodic and additional sounding reference signal transmission respectively, see TS 36.211 [21], clause 5.5.3. UE shall release *srs-AntennaPort* if *SoundingRS-UL-ConfigDedicated* is released. |
| ***srs-Bandwidth, srs-BandwidthAp, srs-BandwidthAdd***  Parameter:  for periodic, aperiodic and additional sounding reference signal transmission respectively, see TS 36.211 [21], tables 5.5.3.2-1, 5.5.3.2-2, 5.5.3.2-3 and 5.5.3.2-4. For LAA SCell only bw0 is applied. |
| ***srs-BandwidthConfig***  Parameter: SRS Bandwidth Configuration. See TS 36.211, [21], tables 5.5.3.2-1, 5.5.3.2-2, 5.5.3.2-3 and 5.5.3.2-4. Actual configuration depends on UL bandwidth. bw0 corresponds to value 0, bw1 to value 1 and so on. |
| ***srs-ConfigApDCI-Format0 / srs-ConfigApDCI-Format1a2b2c / srs-ConfigApDCI-Format4***  Parameters indicate the resource configurations for aperiodic sounding reference signal transmissions triggered by DCI formats 0, 1A, 2B, 2C, 4. See TS 36.213 [23], clause 8.2. |
| ***srs-ConfigIndex, srs-ConfigIndexAp***  Parameter: ISRS for periodic and aperiodic sounding reference signal transmission respectively except for an LAA SCell. See TS 36.213 [23], tables 8.2-1 and 8.2-2, for periodic and TS 36.213 [23], tables 8.2-4 an8.2-5, for aperiodic and additional SRS transmission. If both *srs-ConfigIndexAp-r10* and *srs-ConfigIndexAp-r16* are included, E-UTRAN configures the same value for both fields. |
| ***srs-DurationAdd***  Indicates the duration of the additional SRS including guard symbols within a UL subframe, see TS 36.211 [21], clause 5.5.3. E-UTRAN configures *addSRS-StartPos* and this field such that all the configured additional SRS occur within the same subframe. |
| ***srs-GuardSymbolAS-Add***  If enabled, there is a guard period of one symbol after antenna switching, see TS 36.211 [21], clause 5.5.3 and TS 36.213 [23] clause 8.2. |
| ***srs-GuardSymbolFH-Add***  If enabled, there is a guard period of one symbol after frequency hopping, see TS 36.211 [21], clause 5.5.3 and TS 36.213 [23] clause 8.2. |
| ***srs-HoppingBandwidth, srs-HoppingBandwidthAdd***  Parameter: SRS hopping bandwidth  for periodic and additional sounding reference signal transmission respectively except for an LAA SCell, see TS 36.211 [21], clause 5.5.3.2, where hbw0 corresponds to value 0, hbw1 to value 1 and so on. |
| ***srs-MaxUpPts***  Parameter: srsMaxUpPts, see TS 36.211 [21], clause 5.5.3.2. If this field is present, reconfiguration of  applies for UpPts, otherwise reconfiguration does not apply. |
| ***srs-RepNumAdd***  Parameter: R which indicates the number of the additional SRS repetitions, see TS 36.211 [21], clause 5.5.3.2 and TS 36.213 [23] clause 8.3. |
| ***srs-StartPosAdd***  Indicates the starting position of the additional SRS within a UL subframe excluding UpPTS, see TS 36.211 [21], clause 5.5.3. |
| ***srs-SubframeConfig***  Parameter: SRS SubframeConfiguration except for an LAA SCell. See TS 36.211, [21], table 5.5.3.3-1, applies for FDD whereas TS 36.211 [21], table 5.5.3.3-2, applies for TDD. sc0 corresponds to value 0, sc1 corresponds to value 1 and so on. |
| ***srs-SubframeIndication***  Parameter: SRS subframe indication in SRS parameter set configuration for aperiodic sounding reference signal transmission on an LAA SCell configured with uplink, see TS 36.213 [23]. |
| ***srs-UpPtsAdd***  The field only applies for TDD and frame structure type 3, see TS 36.211 [21]. If E-UTRAN configures both *soundingRS-UL-ConfigDedicatedUpPTsExt* and *soundingRS-UL-ConfigDedicatedAperiodicUpPTsExt,* *srs-UpPtsAdd* in both fields is set to the same value. If E-UTRAN configures *soundingRS-UL-PeriodicConfigDedicatedUpPTsExtList-r14* with a number of *soundingRS-UL-ConfigDedicatedUpPTsExt* and/or *soundingRS-UL-AperiodicConfigDedicatedList-r14* with a number of *soundingRS-UL-ConfigDedicatedAperiodicUpPTsExt*, *srs-UpPtsAdd* in all fields are set to the same value. |
| ***transmissionComb, transmissionCombAp, srs-TransmissionCombAdd***  Parameter:  for periodic, aperiodic and additional sounding reference signal transmission respectively, see TS 36.211 [21], clause 5.5.3.2. |

| Conditional presence | Explanation |
| --- | --- |
| *TDD* | This field is optional present for TDD, need OR; it is not present for FDD and the UE shall delete any existing value for this field. |

#### – *SPDCCH-Config*

The IE SPDCCH-Config is used to specify the UE specific SPDCCH configuration.

*SPDCCH-Config* information element

-- ASN1START

SPDCCH-Config-r15 ::= CHOICE {

release NULL,

setup SEQUENCE {

spdcch-L1-ReuseIndication-r15 ENUMERATED {n0,n1,n2} OPTIONAL, -- Need OR

spdcch-SetConfig-r15 SPDCCH-Set-r15 OPTIONAL -- Need OR

}

}

SPDCCH-Set-r15 ::= SEQUENCE (SIZE (1..4)) OF SPDCCH-Elements-r15

SPDCCH-Elements-r15 ::= CHOICE {

release NULL,

setup SEQUENCE {

spdcch-SetConfigId-r15 INTEGER (0..3) OPTIONAL, -- Need OR

spdcch-SetReferenceSig-r15 ENUMERATED {crs, dmrs} OPTIONAL, -- Need OR

transmissionType-r15 ENUMERATED {localised, distributed} OPTIONAL, -- Need OR

spdcch-NoOfSymbols-r15 INTEGER (1..2) OPTIONAL, -- Need OR

dmrs-ScramblingSequenceInt-r15 INTEGER (0..503) OPTIONAL, -- Need OR

dci7-CandidatesPerAL-PDCCH-r15 SEQUENCE (SIZE(1..4)) OF

DCI7-Candidates-r15 OPTIONAL, -- Need OR

dci7-CandidateSetsPerAL-SPDCCH-r15 SEQUENCE (SIZE(1..2)) OF

DCI7-CandidatesPerAL-SPDCCH-r15 OPTIONAL, -- Need OR

resourceBlockAssignment-r15 SEQUENCE{

numberRB-InFreq-domain-r15 INTEGER (2..100),

resourceBlockAssignment-r15 BIT STRING (SIZE(98))

} OPTIONAL, -- Need OR

subslotApplicability-r15 BIT STRING (SIZE(5)) OPTIONAL, -- Need OR

al-StartingPointSPDCCH-r15 SEQUENCE (SIZE(1..4)) OF

INTEGER(0..49) OPTIONAL, -- Need OR

subframeType-r15 ENUMERATED {mbsfn, nonmbsfn, all} OPTIONAL, -- Need OR

rateMatchingMode-r15 ENUMERATED {m1, m2, m3, m4} OPTIONAL, -- Need OR

...

}

}

DCI7-Candidates-r15 ::= INTEGER (0..6)

DCI7-CandidatesPerAL-SPDCCH-r15 ::= SEQUENCE (SIZE(1..4)) OF DCI7-Candidates-r15

-- ASN1STOP

| *SPDCCH-Config* field descriptions |
| --- |
| ***al-StartingPointSPDCCH***  Indicates the starting SCCE index for an aggregation level, see TS 36.213 [23], clause 9.1.6. |
| ***dci7-Candidates***  Number of candidates in each aggregation level for DCI format 7. The number of PDCCH/SPDCCH candidate(s) M\_DCI format 7^((L)) at aggregation level L for monitoring DCI format 7 in PDCCH and SPDCCH region shall conform to the following restriction:  • less than or equal to 2 for aggregation level 4 and 8,  • less than or equal to 6 for aggregation level 1 and 2 |
| ***dci7-CandidatesPerAL-SPDCCH***  SPDCCH candidates configured per aggregation level in SPDCCH region |
| ***dmrs-ScramblingSeqSPDCCH***  The DMRS scrambling sequence initialization parameter defined in TS 36.211 [21], clause 6.10.3A.1. |
| ***numberRB-InFreq-domain***  Indicates the number of resource-blocks in the frequency domain used for the SPDCCH set. There is no restriction on the number of RBs in the frequency domain that can be configured to an SPDCCH resouce set (up to 100), but at least two need to be configured to contain at least one SCCE. The granularity of resource block allocation in frequency domain for configuring an SPDCCH resource set is one in case spdcch-SetReferenceSig-r15 is set to crs. The granularity of resource block allocation for configuring an SPDCCH resource set is two in case sPDCCH-SetReferenceSig-r15 is set to dmrs. |
| ***rateMatchingMode***  Indicates, per resource-set, the mode of SPDCCH rate-matching operation  • Mode 1: UE rate-matches only around the DCI format 7 scheduling the slot or subslot PDSCH (if transmitted in theSPDCCH resouce-set), otherwise no rate-matching is performed for the RB set.  • Mode 2: UE rate-matches around the whole SPDCCH resource set  • Mode 3: UE rate-matches around the whole SPDCCH resource set if DCI format 7 scheduling the slot or subslot PDSCH is found in the resource-set, otherwise no rate-matching is performed for the RB set.  • Mode 4: UE rate-matches around the whole SPDCCH resource set if DCI format 7 scheduling the slot or subslot PDSCH is not found in the resource-set, otherwise UE rate-matches only around the DCI format 7 scheduling the slot or subslot PDSCH (if transmitted in the SPDCCH resource-set)  If the DCI format 7 scheduling the slot or subslot PDSCH is found on a candidate belonging to two SPDCCH resource sets, the DCI format 7 is assumed to be found in both resource sets. |
| ***resourceBlockAssignment***  Indicates the index to a specific combination of physical resource block in frequency for SPDCCH set, see TS 36.213 [23], clause 9.1.4.4. The value range is dependent on the combinatorial number defined in 36.213 [23], clause 9.1.4.4 with the assumption of no limitation in the number of RBs in frequency domain configured by the set*.* |
| ***spdcch-NoOfSymbols***  Indicates the number of OFDM symbols that the CRS based SPDCCH is mapped over. |
| ***spdcch-L1-ReuseIndication***  For the up to two resource sets configured with the same *subframeType* applicability, the *SPDCCH-L1-ReuseIndication* defines the allowed combinations for the two resource sets: {1,1}, {2,0} or {0,2} corresponding to the values n0, n1 and n2 repsectively. In case one resource set is configured, the allowed combinations are {2, 0} or {0,2} corresponding to n1 or n2. EUTRAN does not configure n0 in case one resource set is configured. |
| ***spdcch-SetConfigId***  Indicates the ID of the SPDCCH set configured in *SPDCCH-Elements*. Maximum two sets can be configured for MBSFN and two for non-MBSFN. |
| ***spdcch-SetReferenceSig***  Indicates CRS or DMRS based SPDCCH set. |
| ***subframeType***  Indicates applicable subframe type(s) for the SPDCCH set. CRS-based SPDCCH is only applied to non-MBSFN subframe. |
| ***subslotApplicability***  Indicates the set of subslots within the subframe where SPDCCH candidate set per aggregation levels applies, see *DCI7-CandidateSetsPerAL-SPDCCH*. The bitmap applies to the 5 DL subslot indices in a DL subframe. The first element in the sequence *DCI7-CandidateSetsPerAL-SPDCCH* applies to the indicated *subslotApplicability*. The second element in the sequence (if present) applies to the complement of the *subslotApplicability.* |
| ***transmissionType***  Indicates whether distributed or localized SPDCCH transmission mode is used as defined in TS 36.211 [21], clause 6.8A.1. |

#### – *SPS-Config*

The IE *SPS-Config* is used to specify the semi-persistent scheduling configuration.

*SPS-Config* information element

-- ASN1START

SPS-Config ::= SEQUENCE {

semiPersistSchedC-RNTI C-RNTI OPTIONAL, -- Need OR

sps-ConfigDL SPS-ConfigDL OPTIONAL, -- Need ON

sps-ConfigUL SPS-ConfigUL OPTIONAL -- Need ON

}

SPS-Config-v1430 ::= SEQUENCE {

ul-SPS-V-RNTI-r14 C-RNTI OPTIONAL, -- Need OR

sl-SPS-V-RNTI-r14 C-RNTI OPTIONAL, -- Need OR

sps-ConfigUL-ToAddModList-r14 SPS-ConfigUL-ToAddModList-r14 OPTIONAL, -- Need ON

sps-ConfigUL-ToReleaseList-r14 SPS-ConfigUL-ToReleaseList-r14 OPTIONAL, -- Need ON

sps-ConfigSL-ToAddModList-r14 SPS-ConfigSL-ToAddModList-r14 OPTIONAL, -- Need ON

sps-ConfigSL-ToReleaseList-r14 SPS-ConfigSL-ToReleaseList-r14 OPTIONAL -- Need ON

}

SPS-ConfigUL-ToAddModList-r14 ::= SEQUENCE (SIZE (1..maxConfigSPS-r14)) OF SPS-ConfigUL

SPS-ConfigUL-ToReleaseList-r14 ::= SEQUENCE (SIZE (1..maxConfigSPS-r14)) OF SPS-ConfigIndex-r14

SPS-ConfigSL-ToAddModList-r14 ::= SEQUENCE (SIZE (1..maxConfigSPS-r14)) OF SPS-ConfigSL-r14

SPS-ConfigSL-ToReleaseList-r14 ::= SEQUENCE (SIZE (1..maxConfigSPS-r14)) OF SPS-ConfigIndex-r14

SPS-Config-v1530 ::= SEQUENCE {

semiPersistSchedC-RNTI-r15 C-RNTI OPTIONAL, -- Need OR

sps-ConfigDL-r15 SPS-ConfigDL OPTIONAL, -- Need ON

sps-ConfigUL-STTI-ToAddModList-r15 SPS-ConfigUL-STTI-ToAddModList-r15 OPTIONAL, -- Need ON

sps-ConfigUL-STTI-ToReleaseList-r15 SPS-ConfigUL-STTI-ToReleaseList-r15 OPTIONAL, -- Need ON

sps-ConfigUL-ToAddModList-r15 SPS-ConfigUL-ToAddModList-r15 OPTIONAL, -- Need ON

sps-ConfigUL-ToReleaseList-r15 SPS-ConfigUL-ToReleaseList-r15 OPTIONAL -- Need ON

}

SPS-Config-v1540 ::= SEQUENCE {

sps-ConfigDL-STTI-r15 SPS-ConfigDL-STTI-r15 OPTIONAL -- Need OR

}

SPS-ConfigUL-STTI-ToAddModList-r15 ::= SEQUENCE (SIZE (1..maxConfigSPS-r15)) OF SPS-ConfigUL-STTI-r15

SPS-ConfigUL-STTI-ToReleaseList-r15 ::= SEQUENCE (SIZE (1..maxConfigSPS-r15)) OF SPS-ConfigIndex-r15

SPS-ConfigUL-ToAddModList-r15 ::= SEQUENCE (SIZE (1..maxConfigSPS-r15)) OF SPS-ConfigUL

SPS-ConfigUL-ToReleaseList-r15 ::= SEQUENCE (SIZE (1..maxConfigSPS-r15)) OF SPS-ConfigIndex-r15

SPS-ConfigDL ::= CHOICE{

release NULL,

setup SEQUENCE {

semiPersistSchedIntervalDL ENUMERATED {

sf10, sf20, sf32, sf40, sf64, sf80,

sf128, sf160, sf320, sf640, spare6,

spare5, spare4, spare3, spare2,

spare1},

numberOfConfSPS-Processes INTEGER (1..8),

n1PUCCH-AN-PersistentList N1PUCCH-AN-PersistentList,

...,

[[ twoAntennaPortActivated-r10 CHOICE {

release NULL,

setup SEQUENCE {

n1PUCCH-AN-PersistentListP1-r10 N1PUCCH-AN-PersistentList

}

} OPTIONAL -- Need ON

]]

}

}

SPS-ConfigUL ::= CHOICE {

release NULL,

setup SEQUENCE {

semiPersistSchedIntervalUL ENUMERATED {

sf10, sf20, sf32, sf40, sf64, sf80,

sf128, sf160, sf320, sf640, sf1-v1430,

sf2-v1430, sf3-v1430, sf4-v1430, sf5-v1430,

spare1},

implicitReleaseAfter ENUMERATED {e2, e3, e4, e8},

p0-Persistent SEQUENCE {

p0-NominalPUSCH-Persistent INTEGER (-126..24),

p0-UE-PUSCH-Persistent INTEGER (-8..7)

} OPTIONAL, -- Need OP

twoIntervalsConfig ENUMERATED {true} OPTIONAL, -- Cond TDD

...,

[[ p0-PersistentSubframeSet2-r12 CHOICE {

release NULL,

setup SEQUENCE {

p0-NominalPUSCH-PersistentSubframeSet2-r12 INTEGER (-126..24),

p0-UE-PUSCH-PersistentSubframeSet2-r12 INTEGER (-8..7)

}

} OPTIONAL -- Need ON

]],

[[ numberOfConfUlSPS-Processes-r13 INTEGER (1..8) OPTIONAL -- Need OR

]],

[[ fixedRV-NonAdaptive-r14 ENUMERATED {true} OPTIONAL, -- Need OR

sps-ConfigIndex-r14 SPS-ConfigIndex-r14 OPTIONAL, -- Need OR

semiPersistSchedIntervalUL-v1430 ENUMERATED {

sf50, sf100, sf200, sf300, sf400, sf500,

sf600, sf700, sf800, sf900, sf1000, spare5,

spare4, spare3, spare2, spare1} OPTIONAL -- Need OR

]],

[[ cyclicShiftSPS-r15 ENUMERATED {cs0, cs1, cs2, cs3, cs4, cs5, cs6, cs7}

OPTIONAL, -- Need ON

harq-ProcID-Offset-r15 INTEGER (0..7) OPTIONAL, -- Need ON

rv-SPS-UL-Repetitions-r15 ENUMERATED {ulrvseq1, ulrvseq2, ulrvseq3} OPTIONAL, -- Need ON

tpc-PDCCH-ConfigPUSCH-SPS-r15 TPC-PDCCH-Config OPTIONAL, -- Need ON

totalNumberPUSCH-SPS-UL-Repetitions-r15 ENUMERATED {n2,n3,n4,n6} OPTIONAL, -- Need ON

sps-ConfigIndex-r15 SPS-ConfigIndex-r15 OPTIONAL -- Cond SPS

]]

}

}

SPS-ConfigSL-r14 ::= SEQUENCE {

sps-ConfigIndex-r14 SPS-ConfigIndex-r14,

semiPersistSchedIntervalSL-r14 ENUMERATED {

sf20, sf50, sf100, sf200, sf300, sf400,

sf500, sf600, sf700, sf800, sf900, sf1000,

spare4, spare3, spare2, spare1}

}

SPS-ConfigIndex-r14 ::= INTEGER (1..maxConfigSPS-r14)

SPS-ConfigIndex-r15 ::= INTEGER (1..maxConfigSPS-r15)

N1PUCCH-AN-PersistentList ::= SEQUENCE (SIZE (1..4)) OF INTEGER (0..2047)

N1SPUCCH-AN-PersistentList-r15 ::= SEQUENCE (SIZE (1..4)) OF INTEGER (0..2047)

SPS-ConfigDL-STTI-r15 ::= CHOICE{

release NULL,

setup SEQUENCE {

semiPersistSchedIntervalDL-STTI-r15 ENUMERATED {

sTTI1, sTTI2, sTTI3, sTTI4, sTTI6, sTTI8, sTTI12, sTTI16,

sTTI20, sTTI40, sTTI60, sTTI80, sTTI120, sTTI240,

spare2, spare1},

numberOfConfSPS-Processes-STTI-r15 INTEGER (1..12),

twoAntennaPortActivated-r15 CHOICE {

release NULL,

setup SEQUENCE {

n1SPUCCH-AN-PersistentListP1-r15 N1SPUCCH-AN-PersistentList-r15

}

} OPTIONAL, -- Need ON

sTTI-StartTimeDL-r15 INTEGER (0..5),

tpc-PDCCH-ConfigPUCCH-SPS-r15 TPC-PDCCH-Config OPTIONAL, -- Need ON

...

}

}

SPS-ConfigUL-STTI-r15 ::= CHOICE {

release NULL,

setup SEQUENCE {

semiPersistSchedIntervalUL-STTI-r15 ENUMERATED {

sTTI1, sTTI2, sTTI3, sTTI4, sTTI6, sTTI8, sTTI12, sTTI16,

sTTI20, sTTI40, sTTI60, sTTI80, sTTI120, sTTI240,

spare2, spare1},

implicitReleaseAfter ENUMERATED {e2, e3, e4, e8},

p0-Persistent-r15 SEQUENCE {

p0-NominalSPUSCH-Persistent-r15 INTEGER (-126..24),

p0-UE-SPUSCH-Persistent-r15 INTEGER (-8..7)

} OPTIONAL, -- Need OP

twoIntervalsConfig-r15 ENUMERATED {true} OPTIONAL, -- Cond TDD

p0-PersistentSubframeSet2-r15 CHOICE {

release NULL,

setup SEQUENCE {

p0-NominalSPUSCH-PersistentSubframeSet2-r15 INTEGER (-126..24),

p0-UE-SPUSCH-PersistentSubframeSet2-r15 INTEGER (-8..7)

}

} OPTIONAL, -- Need ON

numberOfConfUL-SPS-Processes-STTI-r15 INTEGER (1..12) OPTIONAL, -- Need OR

sTTI-StartTimeUL-r15 INTEGER (0..5),

tpc-PDCCH-ConfigPUSCH-SPS-r15 TPC-PDCCH-Config OPTIONAL, -- Need ON

cyclicShiftSPS-sTTI-r15 ENUMERATED {cs0, cs1, cs2, cs3, cs4, cs5, cs6, cs7} OPTIONAL, -- Need ON

ifdma-Config-SPS-r15 BOOLEAN OPTIONAL, -- Need ON

harq-ProcID-offset-r15 INTEGER (0..15) OPTIONAL, -- Need ON

rv-SPS-STTI-UL-Repetitions-r15 ENUMERATED {ulrvseq1, ulrvseq2, ulrvseq3} OPTIONAL, -- Need ON

sps-ConfigIndex-r15 SPS-ConfigIndex-r15 OPTIONAL, -- Need OR

tbs-scalingFactorSubslotSPS-UL-Repetitions-r15 ENUMERATED {n6, n12} OPTIONAL, -- Need ON

totalNumberPUSCH-SPS-STTI-UL-Repetitions-r15 ENUMERATED {n2,n3,n4,n6} OPTIONAL, -- Need ON

...

}

}

-- ASN1STOP

| *SPS-Config* field descriptions |
| --- |
| ***cyclicShiftSPS, cyclicShiftSPS-sTTI,***  Indicates the cyclic shift to be used for the UE-specific reference signal in case of UL SPS, see TS 36.211 [5] clause 5.2.1.1. |
| ***fixedRV-NonAdaptive***  If this field is present and *skipUplinkTxSPS* is configured, non-adaptive retransmissions on configured uplink grant uses redundancy version 0, otherwise the redundancy version for each retransmission is updated based on the sequence of redundancy versions as described in TS 36.321 [6]. |
| ***harq-ProcID-offset***  If configured, this field indicates the offset used in deriving the HARQ process IDs, see TS 36.321 [6], clause 5.4.1. |
| ***Ifdma-Config-SPS***  Indicated  to be used for the UE-specific reference signal in case of UL SPS see TS 36.211 [5], clause 5.2,1.1. |
| ***implicitReleaseAfter***  Number of empty transmissions before implicit release, see TS 36.321 [6], clause 5.10.2. Value e2 corresponds to 2 transmissions, e3 corresponds to 3 transmissions and so on. If *skipUplinkTxSPS* is configured, the UE shall ignore this field. |
| ***n1PUCCH-AN-PersistentList, n1PUCCH-AN-PersistentListP1***  List of parameter:  for antenna port P0 and for antenna port P1 respectively, see TS 36.213 [23], clause 10.1. Field *n1-PUCCH-AN-PersistentListP1* is applicable only if the *twoAntennaPortActivatedPUCCH-Format1a1b* in *PUCCH-ConfigDedicated-v1020* is set to *true*. Otherwise the field is not configured. |
| ***numberOfConfSPS-Processes***  The number of configured HARQ processes for downlink Semi-Persistent Scheduling*,* see TS 36.321 [6]. |
| ***numberOfConfSPS-Processes-STTI***  The number of configured HARQ processes for downlink Semi-Persistent Scheduling for sTTI in DL*,* see TS 36.321 [6]. |
| ***numberOfConfUlSPS-Processes***  The number of configured HARQ processes for uplink Semi-Persistent Scheduling, see TS 36.321 [6]. E-UTRAN always configures this field for asynchronous UL HARQ. Otherwise it does not configure this field. |
| ***numberOfConfUL-SPS-Processes-STTI***  The number of configured HARQ processes for uplink Semi-Persistent Scheduling for sTTI in UL, see TS 36.321 [6]. E-UTRAN always configures this field for asynchronous UL HARQ. Otherwise it does not configure this field. |
| ***p0-NominalPUSCH-Persistent, p0-NominalSPUSCH-Persistent***  Parameter: . See TS 36.213 [23], clause 5.1.1.1, unit dBm step 1. This field is applicable for persistent scheduling, only. If choice setup is used and *p0-Persistent* is absent, apply the value of *p0-NominalPUSCH* for *p0-NominalPUSCH-Persistent.* If uplink power control subframe sets are configured by *tpc-SubframeSet*, this field applies for uplink power control subframe set 1. |
| ***p0-NominalPUSCH-PersistentSubframeSet2, p0-NominalSPUSCH-PersistentSubframeSet2***  Parameter: . See TS 36.213 [23], clause 5.1.1.1, unit dBm step 1. This field is applicable for persistent scheduling, only. If *p0-PersistentSubframeSet2-r12* is not configured, apply the value of *p0-NominalPUSCH-SubframeSet2-r12* for *p0-NominalPUSCH-PersistentSubframeSet2.* E-UTRAN configures this field only if uplink power control subframe sets are configured by *tpc-SubframeSet*, in which case this field applies for uplink power control subframe set 2. |
| ***p0-UE-PUSCH-Persistent***  Parameter: . See TS 36.213 [23], clause 5.1.1.1, unit dB. This field is applicable for persistent scheduling, only. If choice setup is used and *p0-Persistent* is absent, apply the value of p0-UE-PUSCH for *p0-UE-PUSCH-Persistent.* If uplink power control subframe sets are configured by *tpc-SubframeSet*, this field applies for uplink power control subframe set 1. |
| ***p0-UE-PUSCH-PersistentSubframeSet2***  Parameter: . See TS 36.213 [23], clause 5.1.1.1, unit dB. This field is applicable for persistent scheduling, only. If *p0-PersistentSubframeSet2-r12* is not configured, apply the value of *p0-UE-PUSCH-SubframeSet2* for *p0-UE-PUSCH-PersistentSubframeSet2.* E-UTRAN configures this field only if uplink power control subframe sets are configured by *tpc-SubframeSet*, in which case this field applies for uplink power control subframe set 2. |
| ***rv-SPS-STTI-UL-Repetitions***  Indicates the RV sequence of slot or subslot PUSCH for slot or subslot UL SPS repetitions. Value ulrvseq1= {0, 0, 0, 0, 0, 0} , value ulrvseq2={0, 2, 3, 1, 0, 2} and value ulrvseq3={0, 3, 0, 3, 0, 3}. |
| ***rv-SPS-UL-Repetitions***  Indicates the RV sequence of PUSCH for subframe UL SPS repetitions. Value ulrvseq1= {0, 0, 0, 0, 0, 0} , value ulrvseq2={0, 2, 3, 1, 0, 2} and value ulrvseq3={0, 3, 0, 3, 0, 3}. |
| ***semiPersistSchedC-RNTI***  Semi-persistent Scheduling C-RNTI, see TS 36.321 [6]. If *sps-Config* is present for more than one cells in the same cell group, *semiPersistSchedC-RNTI* is present in only one *sps-Config*. |
| ***semiPersistSchedIntervalDL***  Semi-persistent scheduling interval in downlink, see 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. For TDD, the UE shall round this parameter down to the nearest integer (of 10 sub-frames), e.g. sf10 corresponds to 10 sub-frames, sf32 corresponds to 30 sub-frames, sf128 corresponds to 120 sub-frames. |
| ***semiPersistSchedIntervalDL-STTI***  Semi-persistent scheduling interval for sTTI in downlink, see TS 36.321 [6]. Value in number of sTTI. Value sTTI1 corresponds to a spacing of 1 sTTI interval, sTTI2 corresponds to 2 spacings of sTTI intervals and so on, e.g. sTTI1 equal to sub-slot of 2 symbols or 3 symbols when the type of 2OS sTTI is configured, or e.g. sTTI1 equal to slot of 7 symbols when type of 7OS sTTI is configured. SPS for sTTI is not supported for TDD. |
| ***semiPersistSchedIntervalSL***  Semi-persistent scheduling interval in sidelink, see TS 36.321 [6]. Value in number of sub-frames. Value sf20 corresponds to 20 sub-frames, sf50 corresponds to 50 sub-frames and so on. |
| ***semiPersistSchedIntervalUL***  Semi-persistent scheduling interval in uplink, see 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. For TDD, when the configured Semi-persistent scheduling interval is greater than or equal to 10 sub-frames, the UE shall round this parameter down to the nearest integer (of 10 sub-frames), e.g. sf10 corresponds to 10 sub-frames, sf32 corresponds to 30 sub-frames, sf128 corresponds to 120 sub-frames. If *semiPersistSchedIntervalUL-v1430* is configured, the UE only considers this extension (and igno*res semiPersistSchedIntervalUL* i.e.without suffix*).* |
| ***semiPersistSchedIntervalUL-STTI***  Semi-persistent scheduling interval for sTTI in uplink, see TS 36.321 [6]. Value in number of sTTI. Value sTTI1 corresponds to a spacing of 1 sTTI interval, sTTI2 corresponds to 2 spacings of sTTI intervals and so on, e.g. sTTI1 equal to sub-slot of 2 symbols or 3 symbols when the type of 2OS sTTI is configured, or e.g. sTTI1 equal to slot of 7 symbols when type of 7OS sTTI is configured. SPS for sTTI is not supported for TDD. |
| ***sl-SPS-V-RNTI***  SL Semi-Persistent Scheduling V-RNTI for V2X sidelink communication, see TS 36.321 [6]. |
| ***sps-ConfigIndex***  Indicates the index of one of multiple SL/UL SPS configurations. |
| ***sps-ConfigDL-STTI***  If *sps-ConfigDL-sTTI-r15* is signalled, the UE ignores *sps-ConfigDL*. |
| ***sps-ConfigSL-ToAddModList***  Indicates the SL SPS configurations to be added or modified, identified by *SPS-ConfigIndex*. |
| ***sps-ConfigSL-ToReleaseList***  Indicates the SL SPS configurations to be released, identified by *SPS-ConfigIndex*. |
| ***sps-ConfigUL-STTI-ToAddModList***  Indicates the UL sTTI SPS configurations to be added or modified, identified by *SPS-ConfigIndex.* If this list includes more than one entry, E-UTRAN includes *totalNumberPUSCH-SPS-STTI-UL-Repetitions* in each entry. |
| ***sps-ConfigUL-STTI-ToReleaseList***  Indicates the UL sTTI SPS configurations to be released, identified by *SPS-ConfigIndex*. |
| ***sps-ConfigUL-ToAddModList***  Indicates the UL SPS configurations to be added or modified, identified by *SPS-ConfigIndex*. If this list includes more than one entry, E-UTRAN includes *totalNumberPUSCH-SPS-UL-Repetitions* in each entry. |
| ***sps-ConfigUL-ToReleaseList***  Indicates the UL SPS configurations to be released, identified by *SPS-ConfigIndex*. |
| ***sTTI-StartTimeDL***  Indicates the DL sTTI index start offset for SPS (re-)initialization, see TS 36.321 [6]. |
| ***sTTI-StartTimeUL***  Indicates the UL sTTI index start offset for SPS (re-)initialization, see TS 36.321 [6]. |
| ***tbs-scalingFactorSubslotSPS-UL-Repetitions***  Indicates the TBS scaling factor of subslot PUSCH for UL SPS repetitions. Value n6 corresponds to 1/6 and value n12 corresponds to 1/12. |
| ***totalNumberPUSCH-SPS-STTI-UL-Repetitions***  Indicates the total number of UL transmissions for slot or subslot UL SPS repetitions. If the UE is configured with UL SPS and the configured number of SPS PUSCH transmissions k>1, simultaneous transmission of PUSCH and PUCCH is not configured. |
| ***totalNumberPUSCH-SPS-UL-Repetitions***  Indicates the total number of UL transmissions for subframe UL SPS repetitions. If the UE is configured with UL SPS and the configured number of SPS PUSCH transmissions k>1, simultaneous transmission of PUSCH and PUCCH is not configured. |
| ***tpc-PDCCH-ConfigPUCCH-SPS***  PDCCH configuration for power control of slot/subslot-PUCCH using format 3/3A, see TS 36.212 [22], when *SPS-ConfigDL-STTI* is configured. |
| ***tpc-PDCCH-ConfigPUSCH-SPS***  PDCCH configuration for power control of slot/subslot-PUSCH using format 3/3A, see TS 36.212 [22], when *SPS-ConfigUL-STTI* is configured. If a UE is configured with multiple UL SPS configurations in a serving cell, the same TPC index for DCI format 3/3A applies to all the UL SPS configurations in the serving cell. |
| ***twoIntervalsConfig***  Trigger of two-intervals-Semi-Persistent Scheduling in uplink. See TS 36.321 [6], clause 5.10. If this field is present and the configured Semi-persistent scheduling interval greater than or equal to 10 sub-frames, two-intervals-SPS is enabled for uplink. Otherwise, two-intervals-SPS is disabled. |
| ***ul-SPS-V-RNTI***  UL Semi-Persistent Scheduling V-RNTI for UEs capable of multiple uplink SPS configurations and which support V2X communication, see TS 36.321 [6]. |

| Conditional presence | Explanation |
| --- | --- |
| *TDD* | This field is optional present for TDD, need OR; it is not present for FDD and the UE shall delete any existing value for this field. |
| *SPS* | This field is optional present if sps-ConfigIndex-r14 is not configured, need OR; otherwise it is not present. |

#### – *SPUCCH-Config*

The IE *SPUCCH-Config* is used to specify the UE specific SPUCCH configuration.

*SPUCCH-Config* information element

-- ASN1START

SPUCCH-Config-r15 ::= CHOICE {

release NULL,

setup SEQUENCE {

spucch-Set-r15 SPUCCH-Set-r15 OPTIONAL, -- Need ON

twoAntennaPortActivatedSPUCCH-Format1a1b-r15 ENUMERATED {true} OPTIONAL, -- Need OR

dummy SEQUENCE {

n3SPUCCH-AN-List-r15 SEQUENCE (SIZE (1..4)) OF INTEGER (0..549)

}

}

}

SPUCCH-Config-v1550 ::= CHOICE {

release NULL,

setup SEQUENCE {

twoAntennaPortActivatedSPUCCH-Format3-v1550 SEQUENCE {

n3SPUCCH-AN-List-v1550 SEQUENCE (SIZE (1..4)) OF INTEGER (0..549)

}

}

}

SPUCCH-Set-r15 ::= SEQUENCE (SIZE (1..4)) OF SPUCCH-Elements-r15

SPUCCH-Elements-r15 ::= CHOICE {

release NULL,

setup SEQUENCE {

n1SubslotSPUCCH-AN-List-r15 SEQUENCE (SIZE(1..4)) OF INTEGER (0..1319) OPTIONAL, -- Need OR

n1SlotSPUCCH-FH-AN-List-r15 INTEGER (0..1319) OPTIONAL, -- Need OR

n1SlotSPUCCH-NoFH-AN-List-r15 INTEGER (0..3959) OPTIONAL, -- Need OR

n3SPUCCH-AN-List-r15 INTEGER (0..549) OPTIONAL, -- Need OR

n4SPUCCHSlot-Resource-r15 SEQUENCE (SIZE(1..2)) OF N4SPUCCH-Resource-r15 OPTIONAL, -- Need OR

n4SPUCCHSubslot-Resource-r15 SEQUENCE (SIZE(1..2)) OF N4SPUCCH-Resource-r15 OPTIONAL, -- Need OR

n4maxCoderateSlotPUCCH-r15 INTEGER (0..7) OPTIONAL, -- Need OR

n4maxCoderateSubslotPUCCH-r15 INTEGER (0..7) OPTIONAL, -- Need OR

n4maxCoderateMultiResourceSlotPUCCH-r15 INTEGER (0..7) OPTIONAL, -- Need OR

n4maxCoderateMultiResourceSubslotPUCCH-r15 INTEGER (0..7) OPTIONAL -- Need OR

}

}

N4SPUCCH-Resource-r15 ::= SEQUENCE {

n4startingPRB-r15 INTEGER (0..109),

n4numberOfPRB-r15 INTEGER (0..7)

}

-- ASN1STOP

| *SPUCCH-Config* field descriptions |
| --- |
| ***dummy***  This field is not used in the specification. If received it shall be ignored by the UE. |
| ***n1SlotSPUCCH-FH-AN-List***  Resource configuration for slot-SPUCCH format 1 when frequency hopping is enabled. Parameter: for antenna port P0 and for antenna port P1 respectively, see TS 36.213 [23], clause 10.1. |
| ***n1SlotSPUCCH-NoFH-AN-List***  Resource configuration for slot-SPUCCH format 1 when frequency hopping is disabled. Parameter: for antenna port P0 and for antenna port P1 respectively, see TS 36.213 [23], clause 10.1. |
| ***n1SubslotSPUCCH-AN-List***  Resource configuration for subslot-SPUCCH format 1. Parameter: for antenna port P0 and for antenna port P1 respectively, see TS 36.213 [23], clause 10.1. |
| ***n3SPUCCH-AN-List***  Resource index for slot-SPUCCH format 3: , see TS 36.213 [23], clause 10.1. |
| ***n4maxCoderateSlotPUCCH, n4maxCoderateSubslotPUCCH***  Indicates the maximum coding rate for slot-PUCCH and subslot-PUCCH format 4 transmission. |
| ***n4maxCoderateMultiResourceSlotPUCCH, n4maxCoderateMultiResourceSubslotPUCCH***  Indicates the maximum coding rate for slot-PUCCH and subslot-PUCCH format 4 transmission in case of multiple resource configuration. |
| ***n4numberOfPRB, n4numberOfPRBSubslot***  Parameter see TS 36.213 [23], Table 10.1.1-2 for determining SPUCCH resource(s) of SPUCCH format 4. |
| ***n4startingPRB***  Parameter see TS 36.211 [21], clause 5.4A.3 for determining SPUCCH resource(s) of SPUCCH format 4. |
| ***twoAntennaPortActivatedSPUCCH-Format1a1b***  Indicates whether two antenna ports are configured for SPUCCH format 1a/1b for HARQ-ACK, see TS 36.213 [23], clause 10.1. The field also applies for SPUCCH format 1a/1b transmission when *format3* is configured, see TS 36.213 [23], clauses 10.1.2.2.2 and 10.1.3.2.2. |
| ***twoAntennaPortActivatedSPUCCH-Format3***  Indicates whether two antenna ports are configured for SPUCCH format 3 for HARQ-ACK, see TS 36.213 [23], clause 10.1. |

#### – *SRS-TPC-PDCCH-Config*

The IE *SRS-TPC-PDCCH-Config* is used to specify the RNTIs and indexes for A-SRS trigger and TPC according to TS 36.212 [22].

*SRS-TPC-PDCCH-Config* information element

-- ASN1START

SRS-TPC-PDCCH-Config-r14 ::= CHOICE {

release NULL,

setup SEQUENCE {

srs-TPC-RNTI-r14 BIT STRING (SIZE (16)),

startingBitOfFormat3B-r14 INTEGER (0..31),

fieldTypeFormat3B-r14 INTEGER (1..4),

srs-CC-SetIndexlist-r14 SEQUENCE (SIZE(1..4)) OF SRS-CC-SetIndex-r14 OPTIONAL -- Cond SRS-Trigger-TypeA

}

}

SRS-CC-SetIndex-r14 ::= SEQUENCE {

cc-SetIndex-r14 INTEGER (0..3),

cc-IndexInOneCC-Set-r14 INTEGER (0..7)

}

-- ASN1STOP

| *SRS-TPC-PDCCH-Config* field descriptions |
| --- |
| ***cc-IndexInOneCC-Set***  Indicates the CC index in one CC set for Type A associated with the group DCI withSRS request field (optional) and TPC commands for a PUSCH-less SCell |
| ***cc-SetIndex***  Indicates the CC set index for Type A associated with the group DCI withSRS request field (optional) and TPC commands for a PUSCH-less SCell. |
| ***fieldTypeFormat3B***  The type of a field within the group DCI with SRS request fields (optional) and TPC commands for a PUSCH-less SCell, which indicates how many bits in the field are for SRS request (0 or 1/2) and how many bits in the field are for TPC (1 or 2). Note that for Type A, there is a common SRS request field for all SCells in the set, but each SCell has its own TPC command bits. See TS 36.212 [22], clause 5.3.3.1.7A. EUTRAN configures this field with the same value for all PUSCH-less SCells. |
| ***srs-CC-SetIndexlist***  Indicates the index of the *SRS-TPC-PDCCH-Config* for Type A trigger by the group DCI with SRS request field (optional) and TPC commands for a PUSCH-less SCell. Each set may contain at most 8 CCs. |
| ***srs-TPC-RNTI***  RNTI for SRS trigger and power control using DCI format 3B, see TS 36.212 [22], clause 5.1.3.1. |
| ***startingBitOfFormat3B***  The starting bit position of a block within the group DCI with SRS request fields (optional) and TPC commands for a PUSCH-less SCell. |

| Conditional presence | Explanation |
| --- | --- |
| *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. |

#### – *TDD-Config*

The IE *TDD-Config* is used to specify the TDD specific physical channel configuration.

*TDD-Config* information element

-- ASN1START

TDD-Config ::= SEQUENCE {

subframeAssignment ENUMERATED {

sa0, sa1, sa2, sa3, sa4, sa5, sa6},

specialSubframePatterns ENUMERATED {

ssp0, ssp1, ssp2, ssp3, ssp4,ssp5, ssp6, ssp7,

ssp8}

}

TDD-Config-v1130 ::= SEQUENCE {

specialSubframePatterns-v1130 ENUMERATED {ssp7,ssp9}

}

TDD-Config-v1430 ::= SEQUENCE {

specialSubframePatterns-v1430 ENUMERATED {ssp10}

}

TDD-Config-v1450 ::= SEQUENCE {

specialSubframePatterns-v1450 ENUMERATED {ssp10-CRS-LessDwPTS}

}

TDD-ConfigSL-r12 ::= SEQUENCE {

subframeAssignmentSL-r12 ENUMERATED {

none, sa0, sa1, sa2, sa3, sa4, sa5, sa6}

}

-- ASN1STOP

| *TDD-Config* field descriptions |
| --- |
| ***specialSubframePatterns***  Indicates Configuration as in TS 36.211 [21], table 4.2-1, where *ssp0* points to Configuration 0, *ssp1* to Configuration 1 etc. Value *ssp7* points to Configuration 7 for extended cyclic prefix, value *ssp9* points to Configuration 9 for normal cyclic prefix and value *ssp10* points to Configration 10 for normal cyclic prefix. Value *ssp10-CRS-LessDwPTS* corresponds to *ssp10* without CRS transmission on the 5th symbol of DwPTS. E-UTRAN signals *ssp7* only when setting *specialSubframePatterns* (without suffix i.e. the version defined in REL-8) to *ssp4*. E-UTRAN signals value *ssp9* only when setting *specialSubframePatterns* (without suffix) to *ssp5*. E-UTRAN signals value *ssp10* or *ssp10-CRS-LessDwPTS* only when setting *specialSubframePatterns* (without suffix) to *ssp0* or *ssp5*. If *specialSubframePatterns-v1130*, *specialSubframePatterns-v1430,* or *specialSubframePatterns-v1450* is present, the UE shall ignore *specialSubframePatterns* (without suffix). If *specialSubframePatterns-v1430* or *specialSubframePatterns-v1450* is present, the UE shall ignore *specialSubframePatterns-v1130.* E-UTRAN does not simultanuosly configure *TDD-Config-v1430* and *TDD-Config-v1450.* |
| ***subframeAssignment***  Indicates DL/UL subframe configuration where sa0 points to Configuration 0, sa1 to Configuration 1 etc. as specified in TS 36.211 [21], table 4.2-2. E-UTRAN configures the same value for serving cells residing on same frequency band. |
| ***subframeAssignmentSL***  Indicates UL/ DL subframe configuration where sa0 points to Configuration 0, sa1 to Configuration 1 etc. as specified in TS 36.211 [21], table 4.2-2. The value *none* means that no TDD specific physical channel configuration is applicable (i.e. the carrier on which *MasterInformationBlock-SL* is transmitted is an FDD UL carrier or the carrier on which *MasterInformationBlock-SL-V2X* is transmitted is a carrier for V2X sidelink communication). |

#### – *TDM-PatternConfig*

The IE *TDM-PatternConfig* is used to specify the UL/DL reference configuration indicating the time during which a UE configured with (NG)EN-DC or NE-DC is allowed to transmit, as specified in TS 38.101-3 [101] and TS 38.213 [88].

*TDM-PatternConfig* information element

-- ASN1START

TDM-PatternConfig-r15 ::= CHOICE {

release NULL,

setup SEQUENCE {

subframeAssignment-r15 SubframeAssignment-r15,

harq-Offset-r15 INTEGER (0..9)

}

}

SubframeAssignment-r15 ::= ENUMERATED {sa0, sa1, sa2, sa3, sa4, sa5, sa6}

-- ASN1STOP

| *TDM-PatternConfig* field descriptions |
| --- |
| ***subframeAssignment***  Indicates DL/UL subframe configuration where sa0 points to Configuration 0, sa1 to Configuration 1 etc. as specified in TS 36.211 [21], table 4.2-2. When configured in EN-DC with LTE TDD PCell, the value range of this field is {sa2, sa4, sa5}. |
| ***harq-Offset***  Indicates a HARQ subframe offset that is applied to the subframes designated as UL in the associated subrame assignment, see TS 36.213 [23]. When configured in EN-DC with LTE TDD PCell, the network ensures it does not violate the TDD configuration in SIB1, and the value range of this field is {0, 1, 2, 5, 6}. |

#### – *TimeAlignmentTimer*

The IE *TimeAlignmentTimer* is used to control how long the UE considers the serving cells belonging to the associated TAG to be uplink time aligned. Corresponds to the Timer for time alignment in TS 36.321 [6]. Value in number of sub-frames. Value sf500 corresponds to 500 sub-frames, sf750 corresponds to 750 sub-frames and so on.

*TimeAlignmentTimer* information element

-- ASN1START

TimeAlignmentTimer ::= ENUMERATED {

sf500, sf750, sf1280, sf1920, sf2560, sf5120,

sf10240, infinity}

-- ASN1STOP

#### – *TimeReferenceInfo*

*TimeReferenceInfo* information elements

-- ASN1START

TimeReferenceInfo-r15 ::= SEQUENCE {

time-r15 ReferenceTime-r15,

uncertainty-r15 INTEGER (0..12) OPTIONAL, -- Need OR

timeInfoType-r15 ENUMERATED {localClock} OPTIONAL, -- Need OR

referenceSFN-r15 INTEGER (0..1023) OPTIONAL -- Cond TimeRef

}

ReferenceTime-r15 ::= SEQUENCE {

refDays-r15 INTEGER (0..72999),

refSeconds-r15 INTEGER (0..86399),

refMilliSeconds-r15 INTEGER (0..999),

refQuarterMicroSeconds-r15 INTEGER (0..3999)

}

-- ASN1STOP

| *TimeReferenceInfo* field descriptions |
| --- |
| ***referenceSFN***  This field indicates the reference SFN for time reference information. The *time* field indicates the time at the ending boundary of the SFN indicated by *referenceSFN*. The UE considers the frame indicated by the *referenceSFN* nearest to the frame where the field is received.  If the *time* field is included in *SystemInformationBlockType16* and the *referenceSFN* field is not included, the *time* field indicates the time at the SFN boundary at or immediately after the ending boundary of the SI-window in which *SystemInformationBlockType16* is transmitted. |
| ***time, timeInfoType***  This field indicates time reference with 0.25 us granularity. The indicated time is referenced at the network, i.e., without compensating for RF propagation delay. The indicated time in 0.25 us unit from the origin is *refDays*\*86400\*1000\*4000 + *refSeconds*\*1000\*4000 + *refMilliSeconds*\*4000 + *refQuarterMicroSeconds*. The *refDays* field specifies the sequential number of days (with day count starting at 0) from the origin of the *time* field. If *timeInfoType* is not included, the origin of the *time* field is 00:00:00 on Gregorian calendar date 6 January, 1980 (start of GPS time). If *timeInfoType* is set to *localClock*, the interpretation of the origin of the *time* is unspecified and left up to upper layers.  If *time* field is included in *SystemInformationBlockType16*, this field is excluded when estimating changes in system information, i.e. changes of *time* should neither result in system information change notifications nor in a modification of *systemInfoValueTag* in SIB1. |
| ***uncertainty***  This field indicates the number of LSBs which may be inaccurate in the *refQuarterMicroSeconds* field. If *uncertainty* is absent, the uncertainty of *refQuarterMicroSeconds* is not specified. |

| Conditional presence | Explanation |
| --- | --- |
| *TimeRef* | The field is mandatory present if *TimeReferenceInfo* is included in *DLInformationTransfer* message; otherwise the field is not present. |

#### – *TPC-PDCCH-Config*

The IE *TPC-PDCCH-Config* is used to specify the RNTIs and indexes for PUCCH and PUSCH power control according to TS 36.212 [22]. The power control function can either be setup or released with the IE.

*TPC-PDCCH-Config* information element

-- ASN1START

TPC-PDCCH-Config ::= CHOICE {

release NULL,

setup SEQUENCE {

tpc-RNTI BIT STRING (SIZE (16)),

tpc-Index TPC-Index

}

}

TPC-PDCCH-ConfigSCell-r13 ::= CHOICE {

release NULL,

setup SEQUENCE {

tpc-Index-PUCCH-SCell-r13 TPC-Index

}

}

TPC-Index ::= CHOICE {

indexOfFormat3 INTEGER (1..15),

indexOfFormat3A INTEGER (1..31)

}

-- ASN1STOP

| *TPC-PDCCH-Config* field descriptions |
| --- |
| ***indexOfFormat3***  Index of N when DCI format 3 is used. See TS 36.212 [22], clause 5.3.3.1.6. |
| ***IndexOfFormat3A***  Index of M when DCI format 3A is used. See TS 36.212 [22], clause 5.3.3.1.7. |
| ***tpc-Index***  Index of N or M, see TS 36.212 [22], clauses 5.3.3.1.6 and 5.3.3.1.7, where N or M is dependent on the used DCI format (i.e. format 3 or 3a). |
| ***tpc-Index-PUCCH-SCell***  Index of N or M, see TS 36.212 [22], clauses 5.3.3.1.6 and 5.3.3.1.7, where N or M is dependent on the used DCI format (i.e. format 3 or 3a). |
| ***tpc-RNTI***  RNTI for power control using DCI format 3/3A, see TS 36.212 [22]. |

#### – *TunnelConfigLWIP*

The IE *TunnelConfigLWIP* is used to setup/release LWIP Tunnel.

-- ASN1START

TunnelConfigLWIP-r13 ::= SEQUENCE {

ip-Address-r13 IP-Address-r13,

ike-Identity-r13 IKE-Identity-r13,

...,

[[ lwip-Counter-r13 INTEGER (0..65535) OPTIONAL -- Cond LWIP-Setup

]]

}

IKE-Identity-r13 ::= SEQUENCE {

idI-r13 OCTET STRING

}

IP-Address-r13 ::= CHOICE {

ipv4-r13 BIT STRING (SIZE (32)),

ipv6-r13 BIT STRING (SIZE (128))

}

-- ASN1STOP

| *TunnelConfigLWIP* field descriptions |
| --- |
| ***ip-Address***  Parameter indicates the LWIP-SeGW IP Address to be used by the UE for initiating LWIP Tunnel establishment [32]. |
| ***ike-Identity***  Parameter indicates the IKE Identity elements (IDi) to be used in IKE Authentication Procedures [32]. |
| ***lwip-Counter***  Indicates the parameter used by UE for computing the security keys used in LWIP tunnel establishment, as specified in TS 33.401 [32]. |

| **Conditional presence** | **Explanation** |
| --- | --- |
| *LWIP-Setup* | The field is mandatory present upon setup of LWIP tunnel. Otherwise the field is optional, Need ON. |

#### – *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-v1610 ::= 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. |

#### – *WLAN-Id-List*

The IE *WLAN-Id-List* is used to list WLAN(s) for configuration of WLAN measurements and WLAN mobility set.

-- ASN1START

WLAN-Id-List-r13 ::= SEQUENCE (SIZE (1..maxWLAN-Id-r13)) OF WLAN-Identifiers-r12

-- ASN1STOP

#### – *WLAN-MobilityConfig*

The IE *WLAN-MobilityConfig* is used for configuration of WLAN mobility set and WLAN Status Reporting. E-UTRAN configures at least one WLAN identifier in the *WLAN-MobilityConfig*.

-- ASN1START

WLAN-MobilityConfig-r13 ::= SEQUENCE {

wlan-ToReleaseList-r13 WLAN-Id-List-r13 OPTIONAL, -- Need ON

wlan-ToAddList-r13 WLAN-Id-List-r13 OPTIONAL, -- Need ON

associationTimer-r13 ENUMERATED {s10, s30,

s60, s120, s240} OPTIONAL, -- Need OR

successReportRequested-r13 ENUMERATED {true} OPTIONAL, -- Need OR

...,

[[ wlan-SuspendConfig-r14 WLAN-SuspendConfig-r14 OPTIONAL -- Need ON

]]

}

-- ASN1STOP

| *WLAN-MobilityConfig* field descriptions |
| --- |
| ***associationTimer***  Indicates the maximum time for connection to WLAN before connection failure reporting is initiated. Value s10 means 10 seconds, value s30 means 30 seconds and so on. E-UTRAN includes *associationTimer* only upon change in WLAN mobility set, *lwa-WT-Counter* or *lwip-Counter*. |
| ***successReportRequested***  Indicates whether the UE shall report successful connection to WLAN. Applicable to LWA and LWIP. |
| ***wlan-ToAddList***  Indicates the WLAN identifiers to be added to the WLAN mobility set. |
| ***wlan-ToReleaseList***  Indicates the WLAN identifiers to be removed from the WLAN mobility set. |

#### *– 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-v1610 ::= 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. |

### 6.3.3 Security control information elements

#### – *NextHopChainingCount*

The IE *NextHopChainingCount* is used to update the KeNB key and corresponds to parameter NCC: See TS 33.401 [32], clause 7.2.8.4.

*NextHopChainingCount* information element

-- ASN1START

NextHopChainingCount ::= INTEGER (0..7)

-- ASN1STOP

#### – *SecurityAlgorithmConfig*

The IE *SecurityAlgorithmConfig* is used to configure AS integrity protection algorithm and AS ciphering algorithm for SRBs and DRBs. For RNs, the IE *SecurityAlgorithmConfig* is also used to configure AS integrity protection algorithm for DRBs between the RN and the E-UTRAN.

*SecurityAlgorithmConfig* information element

-- ASN1START

SecurityAlgorithmConfig ::= SEQUENCE {

cipheringAlgorithm CipheringAlgorithm-r12,

integrityProtAlgorithm ENUMERATED {

eia0-v920, eia1, eia2, eia3-v1130, spare4, spare3,

spare2, spare1, ...}

}

CipheringAlgorithm-r12 ::= ENUMERATED {

eea0, eea1, eea2, eea3-v1130, spare4, spare3,

spare2, spare1, ...}

-- ASN1STOP

| *SecurityAlgorithmConfig* field descriptions |
| --- |
| ***cipheringAlgorithm***  Indicates the ciphering algorithm to be used for SRBs and DRBs, as specified in TS 33.401 [32], clause 5.1.3.2. |
| ***integrityProtAlgorithm***  Indicates the integrity protection algorithm to be used for SRBs, as specified in TS 33.401 [32], clause 5.1.4.2. For RNs, this field also indicates the integrity protection algorithm to be used for integrity protection-enabled DRB(s). For UEs capable of user plane integrity protection, this field also indicates the integrity protection algorithm to be used to derive the KUPint key. |

#### – *ShortMAC-I*

The IE *ShortMAC-I* is used to identify and verify the UE at RRC connection re-establishment. The 16 least significant bits of the MAC-I calculated using the security configuration of the source PCell, as specified in 5.3.7.4.

*ShortMAC-I* information element

-- ASN1START

ShortMAC-I ::= BIT STRING (SIZE (16))

-- ASN1STOP

### 6.3.4 Mobility control information elements

#### – *AdditionalSpectrumEmission*

If an extension is signalled using the extended value range (as defined by IE *AdditionalSpectrumEmission-v10l0*), the corresponding original field, using the value range as defined by IE *AdditionalSpectrumEmission* i.e. without suffix) shall be set to value 32, if signalled. UE supporting an LTE band assigned NS values larger than 32 as defined in TS 36.101 [42], clause 6.2.4, needs to support extension signaling (as defined by IE *AdditionalSpectrumEmission-v10l0*).

*AdditionalSpectrumEmission* information element

-- ASN1START

AdditionalSpectrumEmission ::= INTEGER (1..32)

AdditionalSpectrumEmission-v10l0 ::= INTEGER (33..288)

-- ASN1STOP

#### – *AdditionalSpectrumEmissionNR*

The IE *AdditionalSpectrumEmissionNR* is used to indicate NR emission requirements to be fulfilled by the UE (see TS 38.101-1 [85], clause 6.5.3.3, and TS 38.101-2 [100], clause 6.5.3.2 and TS 38.101-3 [101], clause 6.5B.2)

*AdditionalSpectrumEmissionNR* information element

-- ASN1START

AdditionalSpectrumEmissionNR-r15 ::= INTEGER (0..7)

-- ASN1STOP

#### – *ARFCN-ValueCDMA2000*

The IE *ARFCN-ValueCDMA2000* used to indicate the CDMA2000 carrier frequency within a CDMA2000 band, see C.S0002 [12].

*ARFCN-ValueCDMA2000* information element

-- ASN1START

ARFCN-ValueCDMA2000 ::= INTEGER (0..2047)

-- ASN1STOP

#### – *ARFCN-ValueEUTRA*

The IE *ARFCN-ValueEUTRA* is used to indicate the ARFCN applicable for a downlink, uplink or bi-directional (TDD) E-UTRA carrier frequency, as defined in TS 36.101 [42]. If an extension is signalled using the extended value range (as defined by IE *ARFCN-ValueEUTRA-v9e0*), the UE shall only consider this extension (and hence ignore the corresponding original field, using the value range as defined by IE *ARFCN-ValueEUTRA* i.e. without suffix, if signalled). In dedicated signalling, E-UTRAN only provides an EARFCN corresponding to an E-UTRA band supported by the UE.

*ARFCN-ValueEUTRA* information element

-- ASN1START

ARFCN-ValueEUTRA ::= INTEGER (0..maxEARFCN)

ARFCN-ValueEUTRA-v9e0 ::= INTEGER (maxEARFCN-Plus1..maxEARFCN2)

ARFCN-ValueEUTRA-r9 ::= INTEGER (0..maxEARFCN2)

-- ASN1STOP

NOTE: For fields using the original value range, as defined by IE *ARFCN-ValueEUTRA* i.e. without suffix, value *maxEARFCN* indicates that the E-UTRA carrier frequency is indicated by means of an extension. In such a case, UEs not supporting the extension consider the field to be set to a not supported value.

#### – *ARFCN-ValueGERAN*

The IE *ARFCN-ValueGERAN* is used to specify the ARFCN value applicable for a GERAN BCCH carrier frequency, see TS 45.005 [20].

*ARFCN-ValueGERAN* information element

-- ASN1START

ARFCN-ValueGERAN ::= INTEGER (0..1023)

-- ASN1STOP

#### – *ARFCN-ValueNR*

The IE *ARFCN-ValueNR* is used to indicate the ARFCN applicable for a downlink, uplink or bi-directional (TDD) NR carrier frequency, as defined in TS 38.101 [85].

*ARFCN-ValueNR* information element

-- ASN1START

ARFCN-ValueNR-r15 ::= INTEGER (0.. 3279165)

-- ASN1STOP

#### – *ARFCN-ValueUTRA*

The IE *ARFCN-ValueUTRA* is used to indicate the ARFCN applicable for a downlink (Nd, FDD) or bi-directional (Nt, TDD) UTRA carrier frequency, as defined in TS 25.331 [19].

*ARFCN-ValueUTRA* information element

-- ASN1START

ARFCN-ValueUTRA ::= INTEGER (0..16383)

-- ASN1STOP

#### – *BandclassCDMA2000*

The IE *BandclassCDMA2000* is used to define the CDMA2000 band in which the CDMA2000 carrier frequency can be found, as defined in C.S0057 [24], table 1.5-1.

*BandclassCDMA2000* information element

-- ASN1START

BandclassCDMA2000 ::= ENUMERATED {

bc0, bc1, bc2, bc3, bc4, bc5, bc6, bc7, bc8,

bc9, bc10, bc11, bc12, bc13, bc14, bc15, bc16,

bc17, bc18-v9a0, bc19-v9a0, bc20-v9a0, bc21-v9a0,

spare10, spare9, spare8, spare7, spare6, spare5, spare4,

spare3, spare2, spare1, ...}

-- ASN1STOP

#### – *BandIndicatorGERAN*

The IE *BandIndicatorGERAN* indicates how to interpret an associated GERAN carrier ARFCN, see TS 45.005 [20]. More specifically, the IE indicates the GERAN frequency band in case the ARFCN value can concern either a DCS 1800 or a PCS 1900 carrier frequency. For ARFCN values not associated with one of these bands, the indicator has no meaning.

*BandIndicatorGERAN* information element

-- ASN1START

BandIndicatorGERAN ::= ENUMERATED {dcs1800, pcs1900}

-- ASN1STOP

#### – *CarrierFreqCDMA2000*

The IE *CarrierFreqCDMA2000* used to provide the CDMA2000 carrier information.

*CarrierFreqCDMA2000* information element

-- ASN1START

CarrierFreqCDMA2000 ::= SEQUENCE {

bandClass BandclassCDMA2000,

arfcn ARFCN-ValueCDMA2000

}

-- ASN1STOP

#### – *CarrierFreqGERAN*

The IE *CarrierFreqGERAN* is used to provide an unambiguous carrier frequency description of a GERAN cell.

*CarrierFreqGERAN* information element

-- ASN1START

CarrierFreqGERAN ::= SEQUENCE {

arfcn ARFCN-ValueGERAN,

bandIndicator BandIndicatorGERAN

}

-- ASN1STOP

| *CarrierFreqGERAN* field descriptions |
| --- |
| ***arfcn***  GERAN ARFCN of BCCH carrier. |
| ***bandIndicator***  Indicates how to interpret the ARFCN of the BCCH carrier. |

#### – *CarrierFreqsGERAN*

The IE *CarrierFreqListGERAN* is used to provide one or more GERAN ARFCN values, as defined in TS 45.005 [43], which represents a list of GERAN BCCH carrier frequencies.

*CarrierFreqsGERAN* information element

-- ASN1START

CarrierFreqsGERAN ::= SEQUENCE {

startingARFCN ARFCN-ValueGERAN,

bandIndicator BandIndicatorGERAN,

followingARFCNs CHOICE {

explicitListOfARFCNs ExplicitListOfARFCNs,

equallySpacedARFCNs SEQUENCE {

arfcn-Spacing INTEGER (1..8),

numberOfFollowingARFCNs INTEGER (0..31)

},

variableBitMapOfARFCNs OCTET STRING (SIZE (1..16))

}

}

ExplicitListOfARFCNs ::= SEQUENCE (SIZE (0..31)) OF ARFCN-ValueGERAN

-- ASN1STOP

| *CarrierFreqsGERAN* field descriptions |
| --- |
| ***arfcn-Spacing***  Space, d, between a set of equally spaced ARFCN values. |
| ***bandIndicator***  Indicates how to interpret the ARFCN of the BCCH carrier. |
| ***explicitListOfARFCNs***  The remaining ARFCN values in the set are explicitly listed one by one. |
| ***followingARFCNs***  Field containing a representation of the remaining ARFCN values in the set. |
| ***numberOfFollowingARFCNs***  The number, n, of the remaining equally spaced ARFCN values in the set. The complete set of (n+1) ARFCN values is defined as: {s, ((s + d) mod 1024), ((s + 2\*d) mod 1024) ... ((s + n\*d) mod 1024)}. |
| ***startingARFCN***  The first ARFCN value, s, in the set. |
| ***variableBitMapOfARFCNs***  Bitmap field representing the remaining ARFCN values in the set. The leading bit of the first octet in the bitmap corresponds to the ARFCN = ((s + 1) mod 1024), the next bit to the ARFCN = ((s + 2) mod 1024), and so on. If the bitmap consists of N octets, the trailing bit of octet N corresponds to ARFCN = ((s + 8\*N) mod 1024). The complete set of ARFCN values consists of ARFCN = s and the ARFCN values, where the corresponding bit in the bitmap is set to "1". |

#### – *CarrierFreqListMBMS*

The IE *CarrierFreqListMBMS* is used to indicate the E-UTRA ARFCN values of the one or more MBMS frequencies the UE is interested to receive.

*CarrierFreqListMBMS* information element

-- ASN1START

CarrierFreqListMBMS-r11 ::= SEQUENCE (SIZE (1..maxFreqMBMS-r11)) OF ARFCN-ValueEUTRA-r9

-- ASN1STOP

#### – *CDMA2000-Type*

The IE *CDMA2000-Type* is used to describe the type of CDMA2000 network.

*CDMA2000-Type* information element

-- ASN1START

CDMA2000-Type ::= ENUMERATED {type1XRTT, typeHRPD}

-- ASN1STOP

#### – *CellGlobalIdNR*

The IE *CellGlobalIdNR* specifies the Cell Global Identifier (CGI), the globally unique identity and the tracking area code (TAC) of a cell in NR.

*CellGlobalIdNR* information element

-- ASN1START

CellGlobalIdNR-r16 ::= SEQUENCE {

plmn-Identity-r16 PLMN-Identity,

cellIdentity-r16 CellIdentityNR-r15,

trackingAreaCode-r16 TrackingAreaCodeNR-r15 OPTIONAL

}

-- ASN1STOP

| CellGlobalIdNR field descriptions |
| --- |
| ***cellIdentity***  Identity of the cell within the context of the PLMN. |
| ***plmn-Identity***  Identifies the PLMN of the cell as given by the first PLMN entry in the *plmn-IdentityInfoList* in *SIB1*. |
| ***trackingAreaCode***  Indicates Tracking Area Code to which the cell indicated by *cellIdentity* field belongs. |

#### – *CellIdentity*

The IE *CellIdentity* is used to unambiguously identify a cell within a PLMN.

*CellIdentity* information element

-- ASN1START

CellIdentity ::= BIT STRING (SIZE (28))

-- ASN1STOP

#### – *CellIndexList*

The IE *CellIndexList* concerns a list of cell indices, which may be used for different purposes.

*CellIndexList* information element

-- ASN1START

CellIndexList ::= SEQUENCE (SIZE (1..maxCellMeas)) OF CellIndex

CellIndex ::= INTEGER (1..maxCellMeas)

-- ASN1STOP

#### – *CellReselectionPriority*

The IE *CellReselectionPriority* concerns the absolute priority of the concerned carrier frequency/ set of frequencies (GERAN)/ bandclass (CDMA2000), as used by the cell reselection procedure. Corresponds with parameter "priority" in TS 36.304 [4]. Value 0 means: lowest priority. The UE behaviour for the case the field is absent, if applicable, is specified in TS 36.304 [4].

*CellReselectionPriority* information element

-- ASN1START

CellReselectionPriority ::= INTEGER (0..7)

-- ASN1STOP

#### – *CellSelectionInfoCE*

The IE *CellSelectionInfoCE* contains cell selection information for CE. The *q-RxLevMinCE* corresponds to parameter Qrxlevmin\_CE in TS 36.304 [4]. The *q-QualMinRSRQ-CE* corresponds to parameter Qqualmin\_CE in TS 36.304 [4]. If *q-QualMinRSRQ-CE* is not present, the UE applies the (default) value of negative infinity for Qqualmin.

*CellSelectionInfoCE* information element

-- ASN1START

CellSelectionInfoCE-r13 ::= SEQUENCE {

q-RxLevMinCE-r13 Q-RxLevMin,

q-QualMinRSRQ-CE-r13 Q-QualMin-r9 OPTIONAL -- Need OR

}

CellSelectionInfoCE-v1530 ::= SEQUENCE {

powerClass14dBm-Offset-r15 ENUMERATED {dB-6, dB-3, dB3, dB6, dB9, dB12}

}

-- ASN1STOP

| *CellSelectionInfoCE* field descriptions |
| --- |
| ***powerClass14dBm-Offset***  Parameter "Poffset" in TS 36.304 [4], only applicable for UE supporting *powerClass-14dBm*. Value in dB. Value dB-6 corresponds to -6 dB, dB-3 corresponds to -3 dB and so on. E-UTRAN configures this field only if *cellSelectionInfoCE-r13* is configured. If the field is absent, the UE applies the (default) value of 0 dB for "Poffset" in TS 36.304 [4]. |

#### – *CellSelectionInfoCE1*

The IE *CellSelectionInfoCE1* contains cell selection information for BL UEs or UEs in CE supporting CE Mode B. The *q-RxLevMinCE1* corresponds to parameter Qrxlevmin\_CE1 in TS 36.304 [4]. If *delta-RxLevMinCE1* is not included, actual value Qrxlevmin\_CE1 = *q-RxLevMinCE1* \* 2 [dBm]. If *delta-RxLevMinCE1* is included, the actual value Qrxlevmin\_CE1 =(*q-RxLevMinCE1* + *delta-RxLevMinCE1*) \* 2 [dBm]. The *q-QualMinRSRQ-CE1* corresponds to parameter Qqualmin\_CE1 in TS 36.304 [4]. If *q-QualMinRSRQ-CE1* is not present, the UE applies the (default) value of negative infinity for Qqualmin.

*CellSelectionInfoCE1* information element

-- ASN1START

CellSelectionInfoCE1-r13 ::= SEQUENCE {

q-RxLevMinCE1-r13 Q-RxLevMin,

q-QualMinRSRQ-CE1-r13 Q-QualMin-r9 OPTIONAL -- Need OR

}

CellSelectionInfoCE1-v1360 ::= SEQUENCE {

delta-RxLevMinCE1-v1360 INTEGER (-8..-1)

}

-- ASN1STOP

#### – *CellReselectionSubPriority*

The IE *CellReselectionSubPriority* indicates a fractional value to be added to the value of cellReselectionPriority to obtain the absolute priority of the concerned carrier frequency for E-UTRA and NR. Value oDot2 corresponds to 0.2, oDot4 corresponds to 0.4 and so on.

*CellReselectionSubPriority* information element

-- ASN1START

CellReselectionSubPriority-r13 ::= ENUMERATED {oDot2, oDot4, oDot6, oDot8}

-- ASN1STOP

#### – *CSFB-RegistrationParam1XRTT*

The IE *CSFB-RegistrationParam1XRTT* is used to indicate whether or not the UE shall perform a CDMA2000 1xRTT pre-registration if the UE does not have a valid / current pre-registration.

-- ASN1START

CSFB-RegistrationParam1XRTT ::= SEQUENCE {

sid BIT STRING (SIZE (15)),

nid BIT STRING (SIZE (16)),

multipleSID BOOLEAN,

multipleNID BOOLEAN,

homeReg BOOLEAN,

foreignSIDReg BOOLEAN,

foreignNIDReg BOOLEAN,

parameterReg BOOLEAN,

powerUpReg BOOLEAN,

registrationPeriodBIT STRING (SIZE (7)),

registrationZoneBIT STRING (SIZE (12)),

totalZone BIT STRING (SIZE (3)),

zoneTimerBIT STRING (SIZE (3))

}

CSFB-RegistrationParam1XRTT-v920 ::= SEQUENCE {

powerDownReg-r9 ENUMERATED {true}

}

-- ASN1STOP

| *CSFB-RegistrationParam1XRTT* field descriptions |
| --- |
| ***foreignNIDReg***  The CDMA2000 1xRTT NID roamer registration indicator. |
| ***foreignSIDReg***  The CDMA2000 1xRTT SID roamer registration indicator. |
| ***homeReg***  The CDMA2000 1xRTT Home registration indicator. |
| ***multipleNID***  The CDMA2000 1xRTT Multiple NID storage indicator. |
| ***multipleSID***  The CDMA2000 1xRTT Multiple SID storage indicator. |
| ***nid***  Used along with the *sid* as a pair to control when the UE should Register or Re-Register with the CDMA2000 1xRTT network. |
| ***parameterReg***  The CDMA2000 1xRTT Parameter-change registration indicator. |
| ***powerDownReg***  The CDMA2000 1xRTT Power-down registration indicator. If set to TRUE, the UE that has a valid / current CDMA2000 1xRTT pre-registration will perform a CDMA2000 1xRTT power down registration when it is switched off. |
| ***powerUpReg***  The CDMA2000 1xRTT Power-up registration indicator. |
| ***registrationPeriod***  The CDMA2000 1xRTT Registration period. |
| ***registrationZone***  The CDMA2000 1xRTT Registration zone. |
| ***sid***  Used along with the *nid* as a pair to control when the UE should Register or Re-Register with the CDMA2000 1xRTT network. |
| ***totalZone***  The CDMA2000 1xRTT Number of registration zones to be retained. |
| ***zoneTimer***  The CDMA2000 1xRTT Zone timer length. |

#### – *CellGlobalIdEUTRA*

The IE *CellGlobalIdEUTRA* specifies the Evolved Cell Global Identifier (ECGI), the globally unique identity of a cell in E-UTRA.

*CellGlobalIdEUTRA* information element

-- ASN1START

CellGlobalIdEUTRA ::= SEQUENCE {

plmn-Identity PLMN-Identity,

cellIdentity CellIdentity

}

-- ASN1STOP

| CellGlobalIdEUTRA field descriptions |
| --- |
| ***cellIdentity***  Identity of the cell within the context of the PLMN. |
| ***plmn-Identity***  Identifies the PLMN of the cell as given by the first PLMN entry in the *plmn-IdentityList* in *SystemInformationBlockType1*. |

#### – *CellGlobalIdUTRA*

The IE *CellGlobalIdUTRA* specifies the global UTRAN Cell Identifier, the globally unique identity of a cell in UTRA.

*CellGlobalIdUTRA* information element

-- ASN1START

CellGlobalIdUTRA ::= SEQUENCE {

plmn-Identity PLMN-Identity,

cellIdentity BIT STRING (SIZE (28))

}

-- ASN1STOP

| CellGlobalIdUTRA field descriptions |
| --- |
| ***cellIdentity***  UTRA Cell Identifier which is unique within the context of the identified PLMN as defined in TS 25.331 [19]. |
| ***plmn-Identity***  Identifies the PLMN of the cell as given by the common PLMN broadcast in the MIB, as defined in TS 25.331 [19]. |

#### – *CellGlobalIdGERAN*

The IE *CellGlobalIdGERAN* specifies the Cell Global Identification (CGI), the globally unique identity of a cell in GERAN.

*CellGlobalIdGERAN* information element

-- ASN1START

CellGlobalIdGERAN ::= SEQUENCE {

plmn-Identity PLMN-Identity,

locationAreaCode BIT STRING (SIZE (16)),

cellIdentity BIT STRING (SIZE (16))

}

-- ASN1STOP

| CellGlobalIdGERAN field descriptions |
| --- |
| ***cellIdentity***  Cell Identifier which is unique within the context of the GERAN location area as defined in TS 23.003 [27]. |
| ***locationAreaCode***  A fixed length code identifying the location area within a PLMN as defined in TS 23.003 [27]. |
| ***plmn-Identity***  Identifies the PLMN of the cell, as defined in TS 23.003 [27].. |

#### – *CellGlobalIdCDMA2000*

The IE *CellGlobalIdCDMA2000* specifies the Cell Global Identification (CGI), the globally unique identity of a cell in CDMA2000.

*CellGlobalIdCDMA2000* information element

-- ASN1START

CellGlobalIdCDMA2000 ::= CHOICE {

cellGlobalId1XRTT BIT STRING (SIZE (47)),

cellGlobalIdHRPD BIT STRING (SIZE (128))

}

-- ASN1STOP

| CellGlobalIdCDMA2000 field descriptions |
| --- |
| ***cellGlobalId1XRTT***  Unique identifier for a CDMA2000 1xRTT cell, corresponds to BASEID, SID and NID parameters (in that order) defined in C.S0005 [25]. |
| ***cellGlobalIdHRPD***  Unique identifier for a CDMA2000 HRPD cell, corresponds to SECTOR ID parameter defined in C.S0024 [26], clause 14.9. |

#### – *CellSelectionInfoNFreq*

The IE *CellSelectionInfoNFreq* includes the parameters used for cell selection on a neighbouring frequency, see TS 36.304 [4].

*CellSelectionInfoNFreq* information element

-- ASN1START

CellSelectionInfoNFreq-r13 ::= SEQUENCE {

-- Cell selection information as in SIB1

q-RxLevMin-r13 Q-RxLevMin,

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

-- Cell re-selection information as in SIB3

q-Hyst-r13 ENUMERATED {

dB0, dB1, dB2, dB3, dB4, dB5, dB6, dB8, dB10,

dB12, dB14, dB16, dB18, dB20, dB22, dB24},

q-RxLevMinReselection-r13 Q-RxLevMin,

t-ReselectionEUTRA-r13 T-Reselection

}

-- ASN1STOP

#### – *ConditionalReconfiguration*

The IE *ConditionalReconfiguration* is used to add, modify or release the configuration of a conditional handover, conditional PSCell addition or inter-SN conditional PSCell change per target candidate cell.

*ConditionalReconfiguration* information element

-- ASN1START

ConditionalReconfiguration-r16 ::= SEQUENCE {

condReconfigurationToAddModList-r16 CondReconfigurationToAddModList-r16 OPTIONAL, -- Need ON

condReconfigurationToRemoveList-r16 CondReconfigurationToRemoveList-r16 OPTIONAL, -- Need ON

attemptCondReconf-r16 ENUMERATED {true} OPTIONAL, -- Cond CHO

...

}

CondReconfigurationToRemoveList-r16 ::= SEQUENCE (SIZE (1..maxCondConfig-r16)) OF CondReconfigurationId-r16

-- ASN1STOP

| *ConditionalReconfiguration* field descriptions |
| --- |
| ***attemptCondReconf***  If present, the UE shall perform conditional reconfiguration if selected cell is a target candidate cell and it is the first cell selection after failure as described in 5.3.7.3. |
| ***condReconfigurationToAddModList***  List of conditional reconfigurations (i.e. conditional handover, conditional PSCell addition or inter-SN conditional PSCell change) to add and/or modify. |
| ***condReconfigurationToRemoveList***  List of conditional reconfigurations (i.e. conditional handover, conditional PSCell addition or inter-SN conditional PSCell change) to remove. |

| Conditional presence | Explanation |
| --- | --- |
| *CHO* | The field is optional present, Need OR, if the UE is configured with at least a candidate cell for CHO. Otherwise the field is not present. |

#### – *ConditionalReconfigurationId*

The IE *ConditionalReconfigurationId* is used to identify a conditional reconfiguration (e.g. CHO, CPA or inter-SN CPC).

*ConditionalReconfigurationId* information element

-- ASN1START

CondReconfigurationId-r16 ::= INTEGER (1.. maxCondConfig-r16)

-- ASN1STOP

#### – *CondReconfigurationToAddModList*

The IE *CondReconfigurationToAddModList* concerns a list of conditional reconfigurations (i.e. conditional handover, conditional PSCell addition or inter-SN conditional PSCell change) to add or modify, for each entry the *measId* (associated to the triggering condition configuration) and the associated *RRCConnectionReconfiguration*.

*CondReconfigurationToAddModList* information element

-- ASN1START

CondReconfigurationToAddModList-r16 ::= SEQUENCE (SIZE (1.. maxCondConfig-r16)) OF CondReconfigurationAddMod-r16

CondReconfigurationAddMod-r16 ::= SEQUENCE {

condReconfigurationId-r16 CondReconfigurationId-r16,

triggerCondition-r16 SEQUENCE (SIZE (1..2)) OF MeasId

OPTIONAL, -- Need ON

condReconfigurationToApply-r16 OCTET STRING (CONTAINING RRCConnectionReconfiguration)

OPTIONAL,-- Cond CondReconfigurationAdd

...,

[[

triggerConditionSN-r17 OCTET STRING OPTIONAL -- Need ON

]]

}

-- ASN1STOP

| *CondReconfigurationToAddMod* field descriptions |
| --- |
| ***condReconfigurationToApply***  The RRCConnectionReconfiguration message to be applied when the condition(s) are fulfilled. The *RRCConnectionReconfiguration* in *condReconfigurationToApply* cannot contain a target node SCG configuration for CHO. For CPAC, the *RRCConnectionReconfiguration* message contained in *condReconfigurationToApply* cannot contain the field *scg-State*. |
| ***triggerCondition***  The condition that needs to be fulfilled in order to trigger the execution of a conditional reconfiguration for CHO, CPA or MN initiated inter-SN CPC. When configuring two triggering events (MeasIds) for a candidate cell, the network ensures that both refer to the same *measObject*. For each *condReconfigurationId*, the network always configures either *triggerCondition* or *triggerConditionSN* (not both). |
| ***triggerConditionSN***  Includes the NR *CondReconfigExecCondSN* as specified in TS 38.331 [82]. For each *condReconfigurationId*, the network always configures either *triggerCondition* or *triggerConditionSN* (not both). The field is applied to the case of SN initiated inter-SN CPC. |

| Conditional presence | Explanation |
| --- | --- |
| *CondReconfigurationAdd* | The field is mandatory present if a *condReconfigurationId* is being added. Otherwise it is optional, need ON. |

#### – *CSG-Identity*

The IE *CSG-Identity* is used to identify a Closed Subscriber Group.

*CSG-Identity* information element

-- ASN1START

CSG-Identity ::= BIT STRING (SIZE (27))

-- ASN1STOP

#### – *EphemerisOrbitalParameters*

The IE *EphemerisOrbitalParameters* provides satellite ephemeris in format of orbital parameters.

*EphemerisOrbitalParameters* information element

-- ASN1START

EphemerisOrbitalParameters-r17 ::= SEQUENCE {

semiMajorAxis-r17 INTEGER (0..8589934591),

eccentricity-r17 INTEGER (0..1048575),

periapsis-r17 INTEGER (0..268435455),

longitude-r17 INTEGER (0..268435455),

inclination-r17 INTEGER (-67108864..67108863),

anomaly-r17 INTEGER (0..268435455)

}

-- ASN1STOP

| *EphemerisOrbitalParameters* field descriptions |
| --- |
| ***anomaly***  Mean anomaly M at epoch time, see NIMA TR 8350.2 [110]. Unit in radian.  Step of 2.341\* 10-8 rad. Actual value = field value \* (2.341\* 10-8). |
| ***eccentricity***  Eccentricity e, see NIMA TR 8350.2 [110].  Step 1.431 \* 10-8. Actual value = field value \* (1.431 \* 10-8). |
| ***inclination***  Inclination i, see NIMA TR 8350.2 [110]. Unit in radian.  Step of 2.341\* 10-8 rad. Actual value = field value \* (2.341\* 10-8). |
| ***longitude***  Longitude of ascending node Ω, see NIMA TR 8350.2 [110]. Unit in radian.  Step of 2.341\* 10-8 rad. Actual value = field value \* (2.341\* 10-8). |
| ***periapsis***  Argument of periapsis ω, see NIMA TR 8350.2 [110]. Unit in radian.  Step of 2.341\* 10-8 rad. Actual value = field value \* (2.341\* 10-8). |
| ***semiMajorAxis***  Semi major axis α, see NIMA TR 8350.2 [110]. Unit in meter.  Stepof 4.249 \* 10-3 m. Actual value = 6500000 + field value \* (4.249 \* 10-3). |

#### – *EphemerisStateVectors*

The IE *EphemerisStateVectors* provides satellite ephemeris in format of position and velocity state vectors in ECEF.

*EphemerisStateVectors* information element

-- ASN1START

EphemerisStateVectors-r17 ::= SEQUENCE {

positionX-r17 PositionStateVector-r17,

positionY-r17 PositionStateVector-r17,

positionZ-r17 PositionStateVector-r17,

velocityVX-r17 VelocityStateVector-r17,

velocityVY-r17 VelocityStateVector-r17,

velocityVZ-r17 VelocityStateVector-r17

}

PositionStateVector-r17 ::= INTEGER (-33554432..33554431)

VelocityStateVector-r17 ::= INTEGER (-131072..131071)

-- ASN1STOP

| ***EphemerisStateVectors* field descriptions** |
| --- |
| ***positionX, positionY, positionZ***  X, Y, Z coordinate of satellite position state vector in ECEF. Unit in meter.  Step of 1.3 m. Actual value = field value \* 1.3. |
| ***velocityVX, velocityVY, velocityVZ***  X, Y, Z coordinate of satellite velocity state vector in ECEF. Unit in meter/second.  Step of 0.06 m/s. Actual value = field value \* 0.06. |

#### – *FreqBandIndicator*

The IE *FreqBandIndicator* indicates the E-UTRA operating band as defined in TS 36.101 [42], table 5.5-1. If an extension is signalled using the extended value range (as defined by IE *FreqBandIndicator-v9e0*), the UE shall only consider this extension (and hence ignore the corresponding original field, using the value range as defined by IE *FreqBandIndicator* i.e. without suffix, if signalled).

*FreqBandIndicator* information element

-- ASN1START

FreqBandIndicator ::= INTEGER (1..maxFBI)

FreqBandIndicator-v9e0 ::= INTEGER (maxFBI-Plus1..maxFBI2)

FreqBandIndicator-r11 ::= INTEGER (1..maxFBI2)

-- ASN1STOP

NOTE: For fields using the original value range, as defined by IE *FreqBandIndicator* i.e. without suffix, value *maxFBI* indicates that the frequency band is indicated by means of an extension. In such a case, UEs not supporting the extension consider the field to be set to a not supported value.

#### – *FreqBandIndicatorNR*

The IE *FreqBandIndicatorNR* indicates the NR operating band as defined in TS 38.101 [85].

*FreqBandIndicatorNR* information element

-- ASN1START

FreqBandIndicatorNR-r15 ::= INTEGER (1.. maxFBI-NR-r15)

-- ASN1STOP

#### – *MobilityControlInfo*

The IE *MobilityControlInfo* includes parameters relevant for network controlled mobility to/within E‑UTRA.

*MobilityControlInfo* information element

-- ASN1START

MobilityControlInfo ::= SEQUENCE {

targetPhysCellId PhysCellId,

carrierFreq CarrierFreqEUTRA OPTIONAL, -- Cond HO-toEUTRA2

carrierBandwidth CarrierBandwidthEUTRA OPTIONAL, -- Cond HO-toEUTRA

additionalSpectrumEmission AdditionalSpectrumEmission OPTIONAL, -- Cond HO-toEUTRA

t304 ENUMERATED {

ms50, ms100, ms150, ms200, ms500, ms1000,

ms2000, ms10000-v1310},

newUE-Identity C-RNTI,

radioResourceConfigCommon RadioResourceConfigCommon,

rach-ConfigDedicated RACH-ConfigDedicated OPTIONAL, -- Need OP

...,

[[ carrierFreq-v9e0 CarrierFreqEUTRA-v9e0 OPTIONAL -- Need ON

]],

[[ drb-ContinueROHC-r11 ENUMERATED {true} OPTIONAL -- Cond HO

]],

[[ mobilityControlInfoV2X-r14 MobilityControlInfoV2X-r14 OPTIONAL, -- Need ON

handoverWithoutWT-Change-r14 ENUMERATED {keepLWA-Config, sendEndMarker} OPTIONAL, -- Cond HO

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

rach-Skip-r14 RACH-Skip-r14 OPTIONAL, -- Need OR

sameSFN-Indication-r14 ENUMERATED {true} OPTIONAL -- Cond HO-SFNsynced

]],

[[

mib-RepetitionStatus-r14 BOOLEAN OPTIONAL, -- Need OR

schedulingInfoSIB1-BR-r14 INTEGER (0..31) OPTIONAL -- Cond HO-SFNsynced

]],

[[ daps-Config-r16 DAPS-Config-r16 OPTIONAL -- Cond NotFullConfigHO

]]

}

MobilityControlInfo-v10l0 ::= SEQUENCE {

additionalSpectrumEmission-v10l0 AdditionalSpectrumEmission-v10l0 OPTIONAL -- Need ON

}

MobilityControlInfoSCG-r12 ::= SEQUENCE {

t307-r12 ENUMERATED {

ms50, ms100, ms150, ms200, ms500, ms1000,

ms2000, spare1},

ue-IdentitySCG-r12 C-RNTI OPTIONAL, -- Cond SCGEst,

rach-ConfigDedicated-r12 RACH-ConfigDedicated OPTIONAL, -- Need OP

cipheringAlgorithmSCG-r12 CipheringAlgorithm-r12 OPTIONAL, -- Need ON

...,

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

rach-SkipSCG-r14 RACH-Skip-r14 OPTIONAL -- Need OR

]]

}

MobilityControlInfoV2X-r14 ::= SEQUENCE {

v2x-CommTxPoolExceptional-r14 SL-CommResourcePoolV2X-r14 OPTIONAL, -- Need OR

v2x-CommRxPool-r14 SL-CommRxPoolListV2X-r14 OPTIONAL, -- Need OR

v2x-CommSyncConfig-r14 SL-SyncConfigListV2X-r14 OPTIONAL, -- Need OR

cbr-MobilityTxConfigList-r14 SL-CBR-CommonTxConfigList-r14 OPTIONAL -- Need OR

}

CarrierBandwidthEUTRA ::= SEQUENCE {

dl-Bandwidth ENUMERATED {

n6, n15, n25, n50, n75, n100, spare10,

spare9, spare8, spare7, spare6, spare5,

spare4, spare3, spare2, spare1},

ul-Bandwidth ENUMERATED {

n6, n15, n25, n50, n75, n100, spare10,

spare9, spare8, spare7, spare6, spare5,

spare4, spare3, spare2, spare1} OPTIONAL -- Need OP

}

CarrierFreqEUTRA ::= SEQUENCE {

dl-CarrierFreq ARFCN-ValueEUTRA,

ul-CarrierFreq ARFCN-ValueEUTRA OPTIONAL -- Cond FDD

}

CarrierFreqEUTRA-v9e0 ::= SEQUENCE {

dl-CarrierFreq-v9e0 ARFCN-ValueEUTRA-r9,

ul-CarrierFreq-v9e0 ARFCN-ValueEUTRA-r9 OPTIONAL -- Cond FDD

}

DAPS-Config-r16 ::= SEQUENCE {

daps-PowerCoordinationInfo-r16 DAPS-PowerCoordinationInfo-r16 OPTIONAL, -- Need ON

...

}

DAPS-PowerCoordinationInfo-r16 ::= SEQUENCE {

p-DAPS-Source-r16 INTEGER (1..16),

p-DAPS-Target-r16 INTEGER (1..16),

powerControlMode-r16 INTEGER (1..2)

}

RACH-Skip-r14 ::= SEQUENCE {

targetTA-r14 CHOICE {

ta0-r14 NULL,

mcg-PTAG-r14 NULL,

scg-PTAG-r14 NULL,

mcg-STAG-r14 STAG-Id-r11,

scg-STAG-r14 STAG-Id-r11

},

ul-ConfigInfo-r14 SEQUENCE {

numberOfConfUL-Processes-r14 INTEGER (1..8),

ul-SchedInterval-r14 ENUMERATED {sf2, sf5, sf10},

ul-StartSubframe-r14 INTEGER (0..9),

ul-Grant-r14 BIT STRING (SIZE (16))

} OPTIONAL -- Need OR

}

-- ASN1STOP

| *MobilityControlInfo* field descriptions |
| --- |
| ***additionalSpectrumEmission***  For a UE with no SCells configured for UL in the same band as the PCell, the UE shall apply the value for the PCell instead of the corresponding value from *SystemInformationBlockType2* or *SystemInformationBlockType1*. For a UE with SCell(s) configured for UL in the same band as the PCell, the UE shall, in case all SCells configured for UL in that band are released after handover completion, apply the value for the PCell instead of the corresponding value from *SystemInformationBlockType2* or *SystemInformationBlockType1*. 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. |
| ***carrierBandwidth***  Provides the parameters *Downlink bandwidth*, and *Uplink bandwidth*, see TS 36.101 [42]. |
| ***carrierFreq***  Provides the EARFCN to be used by the UE in the target cell. |
| ***cbr-MobilityTxConfigList***  Indicates the list of CBR ranges and the list of PSSCH transmission parameter configurations available to configure congestion control to the UE for V2X sidelink communication during handover. |
| ***cipheringAlgorithmSCG***  Indicates the ciphering algorithm to be used for SCG DRBs. E-UTRAN includes the field upon SCG change when one or more SCG DRBs are configured. Otherwise E-UTRAN does not include the field. |
| ***dl-Bandwidth***  Parameter: *Downlink bandwidth*, see TS 36.101 [42]. |
| ***drb-ContinueROHC***  This field indicates whether to continue or reset, for this handover, the header compression protocol context for the RLC UM bearers configured with 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. E-UTRAN includes the field only in case of a handover within the same eNB. This field does not apply to any configured DAPS bearers. |
| ***handoverWithoutWT-Change***  Indicates whether UE performs handover where LWA configuration is retained with the same WT If sendEndMarker is configured, the LWA end-marker for PDCP key change indication is used as defined in [8]. If value keepLWA-Config is configured, LWA end marker is not used and UE shall only retain the LWA configuration. |
| ***makeBeforeBreak***  Indicates that the UE shall continue uplink transmission/ downlink reception with the source cell(s) before performing the first transmission through PRACH to the target intra-frequency PCell, or performing initial PUSCH transmission to the target intra-frequency PCell while *rach-Skip* is configured. |
| ***makeBeforeBreakSCG***  Indicates that the UE shall continue uplink transmission/ downlink reception with the source cell(s) before performing the first transmission through PRACH to the target intra-frequency PSCell, or performing initial PUSCH transmission to the target intra-frequency PSCell while *rach-SkipSCG* is configured. |
| ***mib-RepetitionStatus***  Indicates whether additional MIB repetition is enabled in the target cell or not. Value TRUE indicates additional MIB repetition is enabled in the target cell. Value FALSE indicates additional MIB repetition is not enabled in the target cell. The absence of this field indicates additional MIB repetition may or may not be enabled in the target cell. See 5.2.1.2 and TS 36.211 [21], clause 6.4.1. This field is applicable to BL UE or UE in CE. |
| ***mobilityControlInfoV2X***  Indicates the sidelink configurations of the target cell for V2X sidelink communication during handover. |
| ***numberOfConfUL-Processes***  The number of configured HARQ processes for preallocated uplink grant, see TS 36.321 [6], clause 5.20. This field is applicable if a UE is configured with asynchronous HARQ, otherwise it shall be ignored. |
| ***p-DAPS-Source***  Indicates the guaranteed power for the source PCell during a DAPS handover, as specified in TS 36.213 [23]. The value N corresponds to N-1 in TS 36.213 [23]. |
| ***p-DAPS-Target***  Indicates the guaranteed power for the target PCell during a DAPS handover as specified in TS 36.213 [23], Table 5.1.4.2-1. The value N corresponds to N-1 in TS 36.213 [23]. |
| ***powerControlMode***  Indicates the power control mode used in during a DAPS handover. Value 1 corresponds to DC power control mode 1 and value 2 indicates DC power control mode 2, as specified in TS 36.213 [23]. |
| ***rach-ConfigDedicated***  The dedicated random access parameters. If absent the UE applies contention based random access as specified in TS 36.321 [6]. |
| ***rach-Skip***  This field indicates whether random access procedure for the target PCell is skipped. |
| ***rach-SkipSCG***  This field indicates whether random access procedure for the target PSCell is skipped. |
| ***sameSFN-Indication***  This field indicates that the target cell has the same SFN as the source cell and that the BL UE or UE in CE is not required to acquire *MasterInformationBlock* in the target PCell during handover to obtain the SFN of the target cell, as specified in clause 5.3.5.4. |
| ***schedulingInfoSIB1-BR***  Indicates the index to the tables that define *SystemInformationBlockType1-BR* scheduling information. The tables are specified in TS 36.213 [23], Table 7.1.6-1 and Table 7.1.7.2.7-1. Value 0 means *SystemInformationBlockType1-BR* is not scheduled. If absent when *sameSFN-Indication* is present, UE assumes that *SystemInformationBlockType1-BR* scheduling information in target cell may be different from source cell. |
| ***t304***  Timer T304 as described in clause 7.3. ms50 corresponds with 50 ms, ms100 corresponds with 100 ms and so on. EUTRAN includes extended value *ms10000-v1310* only when UE supports CE. |
| ***t307***  Timer T307 as described in clause 7.3. ms50 corresponds with 50 ms, ms100 corresponds with 100 ms and so on. |
| ***targetTA***  This field refers to the timing adjustment indication, see TS 36.213 [23], indicating the NTA value which the UE shall use for the target PTAG of handover or the target PSTAG of SCG change. *ta0* corresponds to NTA=0. *mcg-PTAG* corresponds to the latest NTA value of the PTAG associated with MCG. *scg-PTAG* corresponds to the latest NTA value of the PTAG associated with SCG. *mcg-STAG* corresponds to the latest NTA value of a MCG STAG indicated by the STAG-Id. *scg-STAG* corresponds to the latest NTA value of a SCG STAG indicated by the STAG-Id. |
| ***ul-Bandwidth***  Parameter: *Uplink bandwidth*, see TS 36.101 [42], table 5.6-1. For TDD, the parameter is absent and it is equal to downlink bandwidth. If absent for FDD, apply the same value as applies for the downlink bandwidth. |
| ***ul-Grant***  Indicates the resources of the target PCell/PSCell to be used for the uplink transmission of PUSCH [23], clause 8.8. |
| ***ul-SchedInterval***  Indicates the scheduling interval in uplink, see TS 36.321 [6], clause 5.20. Value in number of sub-frames. Value sf2 corresponds to 2 subframes, sf5 corresponds to 5 subframes and so on. |
| ***ul-StartSubframe***  Indicates the subframe in which the UE may initiate the uplink transmission, see TS 36.321 [6], clause 5.20. Value 0 corresponds to subframe number 0, 1 correponds to subframe number 1 and so on. The subframe indicating a valid uplink grant according to the calculation of UL grant configured by *ul-StartSubframe* and *ul-SchedInterval*, see TS 36.321 [6], clause 5.20, is the same across all radio frames. |
| ***v2x-CommRxPool***  Indicates reception pools for receiving V2X sidelink communication during handover. |
| ***v2x-CommSyncConfig***  Indicates synchronization configurations for performing V2X sidelink communication during handover. |
| ***v2x-CommTxPoolExceptional***  Indicates the transmission resources by which the UE is allowed to transmit V2X sidelink communication during handover. |

| Conditional presence | Explanation |
| --- | --- |
| *FDD* | The field is mandatory with default value (the default duplex distance defined for the concerned band, as specified in TS 36.101 [42]) in case of "FDD"; otherwise the field is not present. |
| *HO* | This field is optionally present, need OP, in case of handover within E-UTRA when the *fullConfig* is not included; otherwise the field is not present. |
| *HO-SFNsynced* | This field is optionally present, need OP, in case of source E-UTRA and target E-UTRA cells are SFN synchronised. |
| *HO-toEUTRA* | The field is mandatory present in case of inter-RAT handover to E-UTRA; otherwise the field is optionally present, need ON. |
| *HO-toEUTRA2* | The field is absent if *carrierFreq-v9e0* is present. Otherwise it is mandatory present in case of inter-RAT handover to E-UTRA and optionally present, need ON, in all other cases. |
| *NotFullConfigHO* | This field is optionally present, Need OR, in case of handover within E-UTRA when the *fullConfig* is not included in the *RRCConnectionReconfiguration* message. Otherwise the field is not present. |
| *SCGEst* | This field is mandatory present in case of SCG establishment; otherwise the field is optionally present, need ON. |

#### – *MobilityParametersCDMA2000 (1xRTT)*

The *MobilityParametersCDMA2000* contains the parameters provided to the UE for handover and (enhanced) CSFB to 1xRTT support, as defined in C.S0097 [53].

*MobilityParametersCDMA2000* information element

-- ASN1START

MobilityParametersCDMA2000 ::= OCTET STRING

-- ASN1STOP

#### – *MobilityStateParameters*

The IE *MobilityStateParameters* contains parameters to determine UE mobility state.

*MobilityStateParameters* information element

-- ASN1START

MobilityStateParameters ::= SEQUENCE {

t-Evaluation ENUMERATED {

s30, s60, s120, s180, s240, spare3, spare2, spare1},

t-HystNormal ENUMERATED {

s30, s60, s120, s180, s240, spare3, spare2, spare1},

n-CellChangeMedium INTEGER (1..16),

n-CellChangeHigh INTEGER (1..16)

}

-- ASN1STOP

| *MobilityStateParameters* field descriptions |
| --- |
| ***n-CellChangeHigh***  The number of cell changes to enter high mobility state. Corresponds to NCR\_H in TS 36.304 [4]. |
| ***n-CellChangeMedium***  The number of cell changes to enter medium mobility state. Corresponds to NCR\_M in TS 36.304 [4]. |
| ***t-Evaluation***  The duration for evaluating criteria to enter mobility states. Corresponds to TCRmax in TS 36.304 [4]. Value in seconds, s30 corresponds to 30 s and so on. |
| ***t-HystNormal***  The additional duration for evaluating criteria to enter normal mobility state. Corresponds to TCRmaxHyst in TS 36.304 [4]. Value in seconds, s30 corresponds to 30 s and so on. |

#### – *MultiBandInfoList*

*MultiBandInfoList* information element

-- ASN1START

MultiBandInfoList ::= SEQUENCE (SIZE (1..maxMultiBands)) OF FreqBandIndicator

MultiBandInfoList-v9e0 ::= SEQUENCE (SIZE (1..maxMultiBands)) OF MultiBandInfo-v9e0

MultiBandInfoList-v10j0 ::= SEQUENCE (SIZE (1..maxMultiBands)) OF NS-PmaxList-r10

MultiBandInfoList-v10l0 ::= SEQUENCE (SIZE (1..maxMultiBands)) OF NS-PmaxList-v10l0

MultiBandInfoList-r11 ::= SEQUENCE (SIZE (1..maxMultiBands)) OF FreqBandIndicator-r11

MultiBandInfo-v9e0 ::= SEQUENCE {

freqBandIndicator-v9e0 FreqBandIndicator-v9e0 OPTIONAL -- Need OP

}

-- ASN1STOP

#### – *MultiFrequencyBandListNR*

The IE MultiFrequencyBandListNR is used to configure a list of one or multiple NR frequency bands.

*MultiFrequencyBandListNR information element*

-- ASN1START

MultiFrequencyBandListNR-r15 ::= SEQUENCE (SIZE (1.. maxMultiBandsNR-r15)) OF FreqBandIndicatorNR-r15

-- ASN1STOP

#### – *NS-PmaxList*

The IE *NS-PmaxList* concerns a list of *additionalPmax* and *additionalSpectrumEmission*, 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 a given frequency band. E-UTRAN does not include the same value of *additionalSpectrumEmission* in *SystemInformationBlockType2* within this list.

*NS-PmaxList* information element

-- ASN1START

NS-PmaxList-r10 ::= SEQUENCE (SIZE (1..maxNS-Pmax-r10)) OF NS-PmaxValue-r10

NS-PmaxList-v10l0 ::= SEQUENCE (SIZE (1..maxNS-Pmax-r10)) OF NS-PmaxValue-v10l0

NS-PmaxValue-r10 ::= SEQUENCE {

additionalPmax-r10 P-Max OPTIONAL, -- Need OP

additionalSpectrumEmission AdditionalSpectrumEmission

}

NS-PmaxValue-v10l0 ::= SEQUENCE {

additionalSpectrumEmission-v10l0 AdditionalSpectrumEmission-v10l0 OPTIONAL -- Need OP

}

-- ASN1STOP

#### *– NS-PmaxListNR*

The IE *NS-PmaxListNR* concerns a list of *additionalPmax* and *additionalSpectrumEmission*, as defined in TS 38.101 [85], table 6.2.3-1 for a given frequency band.

*NS-PmaxListNR* information element

-- ASN1START

NS-PmaxListNR-r15 ::= SEQUENCE (SIZE (1..8)) OF NS-PmaxValueNR-r15

NS-PmaxValueNR-r15 ::= SEQUENCE {

additionalPmaxNR-r15 P-MaxNR-r15 OPTIONAL, -- Need ON

additionalSpectrumEmissionNR-r15 AdditionalSpectrumEmissionNR-r15

}

-- ASN1STOP

#### – *PhysCellId*

The IE *PhysCellId* is used to indicate the physical layer identity of the cell, as defined in TS 36.211 [21].

*PhysCellId* information element

-- ASN1START

PhysCellId ::= INTEGER (0..503)

-- ASN1STOP

#### – *PhysCellIdCDMA2000*

The IE *PhysCellIdCDMA2000* identifies the PNOffset that represents the "Physical cell identity" in CDMA2000.

*PhysCellIdCDMA2000* information element

-- ASN1START

PhysCellIdCDMA2000 ::= INTEGER (0..maxPNOffset)

-- ASN1STOP

#### – *PhysCellIdGERAN*

The IE *PhysCellIdGERAN* contains the Base Station Identity Code (BSIC).

*PhysCellIdGERAN* information element

-- ASN1START

PhysCellIdGERAN ::= SEQUENCE {

networkColourCode BIT STRING (SIZE (3)),

baseStationColourCode BIT STRING (SIZE (3))

}

-- ASN1STOP

| *PhysCellIdGERAN* field descriptions |
| --- |
| ***baseStationColourCode***  Base station Colour Code as defined in TS 23.003 [27]. |
| ***networkColourCode***  Network Colour Code as defined in TS 23.003 [27]. |

#### – *PhysCellIdNR*

The IE *PhysCellIdNR* indicates the physical layer identity (PCI) of an NR cell.

*PhysCellIdNR* information element

-- ASN1START

PhysCellIdNR-r15 ::= INTEGER (0.. 1007)

-- ASN1STOP

#### – *PhysCellIdRange*

The IE *PhysCellIdRange* is used to encode either a single or a range of physical cell identities. The range is encoded by using a *start* value and by indicating the number of consecutive physical cell identities (including *start*) in the range. For fields comprising multiple occurrences of *PhysCellIdRange*, E-UTRAN may configure overlapping ranges of physical cell identities.

*PhysCellIdRange* information element

-- ASN1START

PhysCellIdRange ::= SEQUENCE {

start PhysCellId,

range ENUMERATED {

n4, n8, n12, n16, n24, n32, n48, n64, n84,

n96, n128, n168, n252, n504, spare2,

spare1} OPTIONAL -- Need OP

}

-- ASN1STOP

| *PhysCellIdRange* field descriptions |
| --- |
| ***range***  Indicates the number of physical cell identities in the range (including *start*). Value n4 corresponds with 4, n8 corresponds with 8 and so on. The UE shall apply value 1 in case the field is absent, in which case only the physical cell identity value indicated by *start* applies. |
| ***start***  Indicates the lowest physical cell identity in the range. |

#### – *PhysCellIdRangeNR*

The IE *PhysCellIdRangeNR* is used to encode either a single or a range of physical layer identities of NR cells. The range is encoded by using a *start* value and by indicating the number of consecutive physical layer identities (including *start*) in the range. For fields comprising multiple occurrences of *PhysCellIdRangeNR*, E-UTRAN may configure overlapping ranges of physical layer identities.

*PhysCellIdRangeNR* information element

-- ASN1START

PhysCellIdRangeNR-r16 ::= SEQUENCE {

start PhysCellIdNR-r15,

range ENUMERATED {

n4, n8, n12, n16, n24, n32, n48, n64, n84,

n96, n128, n168, n252, n504, n1008,

spare1} OPTIONAL -- Need OP

}

-- ASN1STOP

| *PhysCellIdRangeNR* field descriptions |
| --- |
| ***range***  Indicates the number of physical layer identities in the range (including *start*). Value n4 corresponds with 4, n8 corresponds with 8 and so on. The UE shall apply value 1 in case the field is absent, in which case only the physical layer identity value indicated by *start* applies. |
| ***start***  Indicates the lowest physical layer identity in the range. |

#### – *PhysCellIdRangeUTRA-FDDList*

The IE *PhysCellIdRangeUTRA-FDDList* is used to encode one or more of *PhysCellIdRangeUTRA-FDD*. While the IE *PhysCellIdRangeUTRA-FDD* is used to encode eithera single physical layer identityor a range of physical layer identities, i.e. primary scrambling codes. Each range is encoded by using a *start* value and by indicating the number of consecutive physical cell identities (including *start*) in the range.

*PhysCellIdRangeUTRA-FDDList* information element

-- ASN1START

PhysCellIdRangeUTRA-FDDList-r9::= SEQUENCE (SIZE (1..maxPhysCellIdRange-r9)) OF PhysCellIdRangeUTRA-FDD-r9

PhysCellIdRangeUTRA-FDD-r9 ::= SEQUENCE {

start-r9 PhysCellIdUTRA-FDD,

range-r9 INTEGER (2..512) OPTIONAL -- Need OP

}

-- ASN1STOP

| *PhysCellIdRangeUTRA-FDDList* field descriptions |
| --- |
| ***range***  Indicates the number of primary scrambling codes in the range (including *start*). The UE shall apply value 1 in case the field is absent, in which case only the primary scrambling code value indicated by *start* applies. |
| ***start***  Indicates the lowest primary scrambling code in the range. |

#### – *PhysCellIdUTRA-FDD*

The IE *PhysCellIdUTRA-FDD* is used to indicate the physical layer identity of the cell, i.e. the primary scrambling code, as defined in TS 25.331 [19].

*PhysCellIdUTRA-FDD* information element

-- ASN1START

PhysCellIdUTRA-FDD ::= INTEGER (0..511)

-- ASN1STOP

#### – *PhysCellIdUTRA-TDD*

The IE *PhysCellIdUTRA-TDD* is used to indicate the physical layer identity of the cell, i.e. the cell parameters ID (TDD), as specified in TS 25.331 [19]. Also corresponds to the Initial Cell Parameter Assignment in TS 25.223 [46].

*PhysCellIdUTRA-TDD* information element

-- ASN1START

PhysCellIdUTRA-TDD ::= INTEGER (0..127)

-- ASN1STOP

#### – *PLMN-Identity*

The IE *PLMN-Identity* identifies a Public Land Mobile Network. Further information regarding how to set the IE are specified in TS 23.003 [27].

*PLMN-Identity* information element

-- ASN1START

PLMN-Identity ::= SEQUENCE {

mcc MCC OPTIONAL, -- Cond MCC

mnc MNC

}

MCC ::= SEQUENCE (SIZE (3)) OF

MCC-MNC-Digit

MNC ::= SEQUENCE (SIZE (2..3)) OF

MCC-MNC-Digit

MCC-MNC-Digit ::= INTEGER (0..9)

-- ASN1STOP

| *PLMN-Identity* field descriptions |
| --- |
| ***mcc***  The first element contains the first MCC digit, the second element the second MCC digit and so on. If the field is absent, it takes the same value as the mcc of the immediately preceding IE PLMN-Identity. See TS 23.003 [27]. |
| ***mnc***  The first element contains the first MNC digit, the second element the second MNC digit and so on. See TS 23.003 [27]. |

| Conditional presence | Explanation |
| --- | --- |
| *MCC* | This IE is mandatory when *PLMN-Identity* is included in *CellGlobalIdEUTRA*, in *CellGlobalIdUTRA,* in *CellGlobalIdGERAN* or in *RegisteredMME*. This IE is also mandatory in the first occurrence of the IE *PLMN-Identity* within the IE *PLMN-IdentityList*. Otherwise it is optional, need OP. |

#### – *PLMN-IdentityList3*

Includes a list of PLMN identities.

*PLMN-IdentityList3* information element

-- ASN1START

PLMN-IdentityList3-r11 ::= SEQUENCE (SIZE (1..16)) OF PLMN-Identity

-- ASN1STOP

#### *– PmaxNR*

The IE *PmaxNR* concerns a list of *additionalPmax* and *additionalSpectrumEmission*, as defined in TS 38.101 [85], table 6.2.3-1 for a given frequency band.

*PmaxNR* information element

-- ASN1START

P-MaxNR-r15 ::= INTEGER (-30..33)

-- ASN1STOP

#### – *PreRegistrationInfoHRPD*

-- ASN1START

PreRegistrationInfoHRPD ::= SEQUENCE {

preRegistrationAllowed BOOLEAN,

preRegistrationZoneId PreRegistrationZoneIdHRPD OPTIONAL, -- cond PreRegAllowed

secondaryPreRegistrationZoneIdList SecondaryPreRegistrationZoneIdListHRPD OPTIONAL -- Need OR

}

SecondaryPreRegistrationZoneIdListHRPD ::= SEQUENCE (SIZE (1..2)) OF PreRegistrationZoneIdHRPD

PreRegistrationZoneIdHRPD ::= INTEGER (0..255)

-- ASN1STOP

| *PreRegistrationInfoHRPD* field descriptions |
| --- |
| ***preRegistrationAllowed***  TRUE indicates that a UE shall perform a CDMA2000 HRPD pre-registration if the UE does not have a valid / current pre-registration. FALSE indicates that the UE is not allowed to perform CDMA2000 HRPD pre-registration in the current cell. |
| ***preRegistrationZoneID***  ColorCode (see C.S0024 [26], C.S0087 [44]) of the CDMA2000 Reference Cell corresponding to the HRPD sector under the HRPD AN that is configured for this LTE cell. It is used to control when the UE should register or re-register. |
| ***secondaryPreRegistrationZoneIdList***  List of SecondaryColorCodes (see C.S0024 [26], C.S0087 [44]) of the CDMA2000 Reference Cell corresponding to the HRPD sector under the HRPD AN that is configured for this LTE cell. They are used to control when the UE should re-register. |

| Conditional presence | Explanation |
| --- | --- |
| *PreRegAllowed* | The field is mandatory in case the *preRegistrationAllowed* is set to *true.* Otherwise the field is not present and the UE shall delete any existing value for this field. |

#### – *Q-QualMin*

The IE *Q-QualMin* is used to indicate for cell selection/ re-selection the required minimum received RSRQ level in the (E-UTRA) cell. Corresponds to parameter Qqualmin in TS 36.304 [4]. Actual value Qqualmin = field value [dB].

*Q-QualMin* information element

-- ASN1START

Q-QualMin-r9 ::= INTEGER (-34..-3)

-- ASN1STOP

#### – *Q-RxLevMin*

The IE *Q-RxLevMin* is used to indicate for cell selection/ re-selection the required minimum received RSRP level in the (E-UTRA) cell. Corresponds to parameter Qrxlevmin in TS 36.304 [4]. Actual value Qrxlevmin = field value \* 2 [dBm].

*Q-RxLevMin* information element

-- ASN1START

Q-RxLevMin ::= INTEGER (-70..-22)

-- ASN1STOP

#### – *Q-OffsetRange*

The IE *Q-OffsetRange* is used to indicate a cell, CSI-RS resource or frequency specific offset to be applied when evaluating candidates for cell re-selection or when evaluating triggering conditions for measurement reporting. The value in dB. Value dB-24 corresponds to -24 dB, dB-22 corresponds to -22 dB and so on.

*Q-OffsetRange* information element

-- ASN1START

Q-OffsetRange ::= ENUMERATED {

dB-24, dB-22, dB-20, dB-18, dB-16, dB-14,

dB-12, dB-10, dB-8, dB-6, dB-5, dB-4, dB-3,

dB-2, dB-1, dB0, dB1, dB2, dB3, dB4, dB5,

dB6, dB8, dB10, dB12, dB14, dB16, dB18,

dB20, dB22, dB24}

-- ASN1STOP

#### – *Q-OffsetRangeInterRAT*

The IE *Q-OffsetRangeInterRAT* is used to indicate a frequency specific offset to be applied when evaluating triggering conditions for measurement reporting. The value in dB.

*Q-OffsetRangeInterRAT* information element

-- ASN1START

Q-OffsetRangeInterRAT ::= INTEGER (-15..15)

-- ASN1STOP

#### – *ReselectionThreshold*

The IE *ReselectionThreshold* is used to indicate an Rx level threshold for cell reselection. Actual value of threshold = field value \* 2 [dB].

*ReselectionThreshold* information element

-- ASN1START

ReselectionThreshold ::= INTEGER (0..31)

-- ASN1STOP

#### – *ReselectionThresholdQ*

The IE *ReselectionThresholdQ* is used to indicate a quality level threshold for cell reselection. Actual value of threshold = field value [dB].

*ReselectionThresholdQ* information element

-- ASN1START

ReselectionThresholdQ-r9 ::= INTEGER (0..31)

-- ASN1STOP

#### – *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. Narrowbands including central 6 PRBs are excluded from the bitmap. The RSS Cell Frequency Location of a specific cell is determined according to *IRSS* = *PCID* MOD (3*NNB*) where *IRSS* is the index of possible RSS frequency locations starting with the lowest location and *NNB* is the number of narrowbands, determined from *narrowbandIndex*, such that there are three non-overlapping RSS locations in each narrowband. |
| ***timeOffsetGranularity***  RSS Time Offset granularity (GRSS). Value *g1* corresponds to 1 frame, value *g2* corresponds to 2 frames, and so on. Only the following values of GRSS are applicable depending on the serving cell RSS periodicity (PRSS) given by parameter *periodicity* in *ce-RSS-Config-r15*:  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.  The actual RSS time offset of a specific cell (ORSS, see TS 36.211 [21] subclause 6.11.3.2) in SFN radio frames is given by (XRSS × GRSS) + ΔRSS where:  - RSS Time Offset of a specific cell (XRSS) is determined based on its PCID using XRSS = FLOOR (PCID/(3 NNB)) modulo MRSS, and distributed across MRSS time locations per PRSS such that MRSS = PRSS /(10 × GRSS); and  - ΔRSS is calculated by using the serving cell XRSS (i.e., based on serving cell PCID and parameters given in *ce-RSS-Config-r15*) such that serving cell ORSS = (XRSS × GRSS) + ΔRSS. |

#### – *RSS-MeasPowerBias*

The IE *RSS-MeasPowerBias* indicates power bias in dB relative to Qoffset 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.

*RSS-MeasPowerBias* information element

-- ASN1START

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

-- ASN1STOP

#### – *SCellIndex*

The IE *SCellIndex* concerns a short identity, used to identify an SCell.

*SCellIndex* information element

-- ASN1START

SCellIndex-r10 ::= INTEGER (1..7)

SCellIndex-r13 ::= INTEGER (1..31)

-- ASN1STOP

#### – *ServCellIndex*

The IE *ServCellIndex* concerns a short identity, used to identify a serving cell (i.e. the PCell or an SCell). Value 0 applies for the PCell, while the *SCellIndex* that has previously been assigned applies for SCells.

*ServCellIndex* information element

-- ASN1START

ServCellIndex-r10 ::= INTEGER (0..7)

ServCellIndex-r13 ::= INTEGER (0..31)

-- ASN1STOP

#### – *SpeedStateScaleFactors*

The IE *SpeedStateScaleFactors* concerns factors, to be applied when the UE is in medium or high speed state, used for scaling a mobility control related parameter.

*SpeedStateScaleFactors* information element

-- ASN1START

SpeedStateScaleFactors ::= SEQUENCE {

sf-Medium ENUMERATED {oDot25, oDot5, oDot75, lDot0},

sf-High ENUMERATED {oDot25, oDot5, oDot75, lDot0}

}

-- ASN1STOP

| *SpeedStateScaleFactors* field descriptions |
| --- |
| ***sf-High***  The concerned mobility control related parameter is multiplied with this factor if the UE is in High Mobility state as defined in TS 36.304 [4]. Value oDot25 corresponds to 0.25, oDot5 corresponds to 0.5, oDot75 corresponds to 0.75 and so on. |
| ***sf-Medium***  The concerned mobility control related parameter is multiplied with this factor if the UE is in Medium Mobility state as defined in TS 36.304 [4]. Value oDot25 corresponds to 0.25, oDot5 corresponds to 0.5, oDot75 corresponds to 0.75 and so on. |

#### – *SystemInfoListGERAN*

The IE *SystemInfoListGERAN* contains system information of a GERAN cell.

*SystemInfoListGERAN* information element

-- ASN1START

SystemInfoListGERAN ::= SEQUENCE (SIZE (1..maxGERAN-SI)) OF

OCTET STRING (SIZE (1..23))

-- ASN1STOP

| *SystemInfoListGERAN* field descriptions |
| --- |
| ***SystemInfoListGERAN***  Each OCTET STRING contains one System Information (SI) message as defined in TS 44.018 [45], table 9.1.1, excluding the L2 Pseudo Length, the RR management Protocol Discriminator and the Skip Indicator or a complete Packet System Information (PSI) message as defined in TS 44.060 [36], table 11.2.1. |

#### – *SystemTimeInfoCDMA2000*

The IE *SystemTimeInfoCDMA2000* informs the UE about the absolute time in the current cell. The UE uses this absolute time knowledge to derive the CDMA2000 Physical cell identity, expressed as PNOffset, of neighbour CDMA2000 cells.

NOTE: The UE needs the CDMA2000 system time with a certain level of accuracy for performing measurements as well as for communicating with the CDMA2000 network (HRPD or 1xRTT).

*SystemTimeInfoCDMA2000* information element

-- ASN1START

SystemTimeInfoCDMA2000 ::= SEQUENCE {

cdma-EUTRA-Synchronisation BOOLEAN,

cdma-SystemTime CHOICE {

synchronousSystemTime BIT STRING (SIZE (39)),

asynchronousSystemTime BIT STRING (SIZE (49))

}

}

-- ASN1STOP

| *SystemTimeInfoCDMA2000* field descriptions |
| --- |
| ***asynchronousSystemTime***  The CDMA2000 system time corresponding to the SFN boundary at or after the ending boundary of the SI-Window in which *SystemInformationBlockType8* is transmitted. E-UTRAN includes this field if the E-UTRA frame boundary is not aligned to the start of CDMA2000 system time. This field size is 49 bits and the unit is 8 CDMA chips based on 1.2288 Mcps. |
| ***cdma-EUTRA-Synchronisation***  TRUE indicates that there is no drift in the timing between E‑UTRA and CDMA2000. FALSE indicates that the timing between E-UTRA and CDMA2000 can drift. NOTE 1 |
| ***synchronousSystemTime***  CDMA2000 system time corresponding to the SFN boundary at or after the ending boundary of the SI-window in which *SystemInformationBlockType8* is transmitted. E-UTRAN includes this field if the E-UTRA frame boundary is aligned to the start of CDMA2000 system time. This field size is 39 bits and the unit is 10 ms based on a 1.2288 Mcps chip rate. |

NOTE 1: The following table shows the recommended combinations of the *cdma-EUTRA-Synchronisation* field and the choice of cdma-SystemTime included by E-UTRAN for FDD and TDD:

|  |  |  |  |
| --- | --- | --- | --- |
| FDD/TDD | *cdma-EUTRA-Synchronisation* | *synchronousSystemTime* | *asynchronousSystemTime* |
| FDD | FALSE | Not Recommended | Recommended |
| FDD | TRUE | Recommended | Recommended |
| TDD | FALSE | Not Recommended | Recommended |
| TDD | TRUE | Recommended | Recommended |

#### – *ThresholdNR*

The IE *ThresholdNR* and IE *ThresholdListNR* contain thresholds for NR related inter-RAT measurements.

*ThresholdNR* information element

-- ASN1START

ThresholdNR-r15 ::= CHOICE{

nr-RSRP-r15 RSRP-RangeNR-r15,

nr-RSRQ-r15 RSRQ-RangeNR-r15,

nr-SINR-r15 RS-SINR-RangeNR-r15

}

ThresholdListNR-r15 ::= SEQUENCE{

nr-RSRP-r15 RSRP-RangeNR-r15 OPTIONAL, -- Need OR

nr-RSRQ-r15 RSRQ-RangeNR-r15 OPTIONAL, -- Need OR

nr-SINR-r15 RS-SINR-RangeNR-r15 OPTIONAL -- Need OR

}

-- ASN1STOP

– *TLE*-*EphemerisParameters*

The IE *TLE-EphemerisParameters* provides satellite ephemeris parameters based on the CCSDS orbit mean-elements message (OMM) format, see [X1]. The reference frame for SGP4 propagator and SGP4 parameter generation is TEME as per the NORAD Space Track standard.

***TLE-EphemerisParameters* information element**

-- ASN1START

TLE-EphemerisParameters-r17 ::= SEQUENCE {

inclination-r17 INTEGER (0..2097151),

argumentPerigee-r17 INTEGER (0..4194303),

rightAscension-r17 INTEGER (0..4194303),

meanAnomaly-r17 INTEGER (0..4194303),

eccentricity-r17 INTEGER (0..16777215),

meanMotion-r17 INTEGER (0..17179869183),

bStarDecimal-r17 INTEGER (-99999..99999),

bStarExponent-r17 INTEGER (-9..9),

epochStar-r17 INTEGER (-1048575..1048575)

}

-- ASN1STOP

| ***TLE-EphemerisParameters* field descriptions** |
| --- |
| ***argumentPerigee***  Argument of perigee, see [X1] Table 4-3: OMM Data. Unit in degree.  Step of 360 / 4194303 degree. Actual value = field value \* (360 / 4194303). |
| ***bStarDecimal***  Decimal part of B\*, see [X1] Table 4-3: OMM Data. Unitininverse Earth radii.  Step of 0.00001 . Actual value = field value \* 0.00001. |
| ***bStarExponent***  Exponent part of B\*, [X1] Table 4-3: OMM Data. |
| ***eccentricity***  Eccentricity, see [X1] Table 4-3: OMM Data.  Step of 0.9999999 / 16777215. Actual value = field value \* (0.9999999 / 16777215). |
| ***epochTimeStar***  Time offset to the beginning of the current week (Monday 00:00:00 UTC) of the Epoch. Unit in second. |
| ***inclination***  Inclination, see [X1] Table 4-3: OMM Data. Unit in degree.  Step of 180 / 2097151 degree. Actual value = field value \* (180 / 2097151). |
| ***meanAnomaly***  Mean anomaly at epoch time, see [X1] Table 4-3: OMM Data. Unit in degree.  Step of 360 / 4194303 degree. Actual value = field value \* (360 / 4194303). |
| ***meanMotion***  Mean motion at epoch time, see [X1] Table 4-3: OMM Data]. Unit in revolution/day.  Step of 99.99999999 / 17179869183 rev/day. Actual value = field value \* (99.99999999 / 17179869183). |
| ***rightAscension***  Right ascension of ascending node, see [X1] Table 4-3: OMM Data. Unit in degree.  Step of 360 / 4194303 degree. Actual value = field value \* (360 / 4194303). |

#### – *TrackingAreaCode*

The IE *TrackingAreaCode* is used to identify a tracking area within the scope of a PLMN, see TS 24.301 [35].

*TrackingAreaCode* information element

-- ASN1START

TrackingAreaCode ::= BIT STRING (SIZE (16))

TrackingAreaCode-5GC-r15 ::= BIT STRING (SIZE (24))

-- ASN1STOP

#### – *T-Reselection*

The IE *T-Reselection* concerns the cell reselection timer TreselectionRAT for E-UTRA, UTRA, GERAN or CDMA2000. Value in seconds. For value 0, behaviour as specified in 7.3.2 applies.

*T-Reselection* information element

-- ASN1START

T-Reselection ::= INTEGER (0..7)

-- ASN1STOP

#### – *T-ReselectionEUTRA-CE*

The IE *T-ReselectionEUTRA-CE* concerns the cell reselection timer TreselectionEUTRA\_CE as specified in TS 36.304 [4]. Value in seconds. For value 0, behaviour as specified in 7.3.2 applies.

*T-ReselectionEUTRA-CE* information element

-- ASN1START

T-ReselectionEUTRA-CE-r13 ::= INTEGER (0..15)

-- ASN1STOP

### 6.3.5 Measurement information elements

#### – *AllowedMeasBandwidth*

The IE *AllowedMeasBandwidth* is used to indicate the maximum allowed measurement bandwidth on a carrier frequency as defined by the parameter Transmission Bandwidth Configuration "NRB" TS 36.104 [47]. The values mbw6, mbw15, mbw25, mbw50, mbw75, mbw100 indicate 6, 15, 25, 50, 75 and 100 resource blocks respectively.

*AllowedMeasBandwidth* information element

-- ASN1START

AllowedMeasBandwidth ::= ENUMERATED {mbw6, mbw15, mbw25, mbw50, mbw75, mbw100}

-- ASN1STOP

#### – *BT-NameList*

The IE *BT-NameList* is used to indicate the names of the Bluetooth beacon which the UE is configured to measure.

*BT-NameList* information element

-- ASN1START

BT-NameListConfig-r15 ::= CHOICE{

release NULL,

setup BT-NameList-r15

}

BT-NameList-r15 ::= SEQUENCE (SIZE (1..maxBT-Name-r15)) OF BT-Name-r15

BT-Name-r15 ::= OCTET STRING (SIZE (1..248))

-- ASN1STOP

| *BT-NameList* field descriptions |
| --- |
| ***bt-Name***  If configured, the UE only performs Bluetooth measurements according to the names identified. For each name, it refers to LOCAL NAME defined in Bluetooth specification [93]. |

#### – *CSI-RSRP-Range*

The IE *CSI-RSRP-Range* specifies the value range used in CSI-RSRP measurements and thresholds. Integer value for CSI-RSRP measurements according to mapping table in TS 36.133 [16].

*CSI-RSRP-Range* information element

-- ASN1START

CSI-RSRP-Range-r12 ::= INTEGER(0..97)

-- ASN1STOP

#### – *Hysteresis*

The IE *Hysteresis* is a parameter used within the entry and leave condition of an event triggered reporting condition. The actual value is field value \* 0.5 dB, except if included in *reportConfigEUTRA* and associated to *eventV1* or *eventV2*. If included in *reportConfigEUTRA* and associated to *eventV1* or *eventV2*, the actual value is field value divided by 100.

*Hysteresis* information element

-- ASN1START

Hysteresis ::= INTEGER (0..30)

-- ASN1STOP

#### – *LocationInfo*

The IE *LocationInfo* is used to transfer detailed location information available at the UE to correlate measurements and UE position information.

*LocationInfo* information element

-- ASN1START

LocationInfo-r10 ::= SEQUENCE {

locationCoordinates-r10 CHOICE {

ellipsoid-Point-r10 OCTET STRING,

ellipsoidPointWithAltitude-r10 OCTET STRING,

...,

ellipsoidPointWithUncertaintyCircle-r11 OCTET STRING,

ellipsoidPointWithUncertaintyEllipse-r11 OCTET STRING,

ellipsoidPointWithAltitudeAndUncertaintyEllipsoid-r11 OCTET STRING,

ellipsoidArc-r11 OCTET STRING,

polygon-r11 OCTET STRING

},

horizontalVelocity-r10 OCTET STRING OPTIONAL,

gnss-TOD-msec-r10 OCTET STRING OPTIONAL,

...,

[[ verticalVelocityInfo-r15 CHOICE {

verticalVelocity-r15 OCTET STRING,

verticalVelocityAndUncertainty-r15 OCTET STRING

} OPTIONAL

]]

}

-- ASN1STOP

|  |
| --- |
| ***LocationInfo field descriptions*** |
| ***ellipsoidArc***  Parameter *EllipsoidArc* defined in TS 36.355 [54]. The first/leftmost bit of the first octet contains the most significant bit. |
| ***ellipsoid-Point***  Parameter *Ellipsoid-Point* defined in TS 36.355 [54]. The first/leftmost bit of the first octet contains the most significant bit. |
| ***ellipsoidPointWithAltitude***  Parameter *EllipsoidPointWithAltitude* defined in TS 36.355 [54]. The first/leftmost bit of the first octet contains the most significant bit. |
| ***ellipsoidPointWithAltitudeAndUncertaintyEllipsoid***  Parameter *EllipsoidPointWithAltitudeAndUncertaintyEllipsoid* defined in TS 36.355 [54]. The first/leftmost bit of the first octet contains the most significant bit. |
| ***ellipsoidPointWithUncertaintyCircle***  Parameter *Ellipsoid-PointWithUncertaintyCircle* defined in TS 36.355 [54]. The first/leftmost bit of the first octet contains the most significant bit. |
| ***ellipsoidPointWithUncertaintyEllipse***  Parameter *EllipsoidPointWithUncertaintyEllipse* defined in TS 36.355 [54]. The first/leftmost bit of the first octet contains the most significant bit. |
| ***gnss-TOD-msec***  Parameter *Gnss-TOD-msec* defined in TS 36.355 [54]. The first/leftmost bit of the first octet contains the most significant bit. |
| ***horizontalVelocity***  Parameter *HorizontalVelocity* defined in TS 36.355 [54]. The first/leftmost bit of the first octet contains the most significant bit. |
| ***polygon***  Parameter *Polygon* defined in TS 36.355 [54]. The first/leftmost bit of the first octet contains the most significant bit. |
| ***verticalVelocityAndUncertainty***  Parameter *verticalVelocityAndUncertainty* corresponds to *horizontalWithVerticalVelocityAndUncertainty* defined in TS 36.355 [54]. The first/leftmost bit of the first octet contains the most significant bit. |
| ***verticalVelocity***  Parameter *verticalVelocity* corresponds to *horizontalWithVerticalVelocity* defined in TS 36.355 [54]. The first/leftmost bit of the first octet contains the most significant bit. |

#### – *LogMeasResultListBT*

The IE *LogMeasResultListBT* covers measured results for Bluetooth.

*LogMeasResultListBT* information element

-- ASN1START

LogMeasResultListBT-r15 ::= SEQUENCE (SIZE (1..maxBT-IdReport-r15)) OF LogMeasResultBT-r15

LogMeasResultBT-r15 ::= SEQUENCE {

bt-Addr-r15 BIT STRING (SIZE (48)),

rssi-BT-r15 INTEGER (-128..127) OPTIONAL,

...

}

-- ASN1STOP

| *LogMeasResultListBT* field descriptions |
| --- |
| ***bt-Addr***  This field indicates the Bluetooth public address of the Bluetooth beacon as defined in TS 36.355 [54]. |
| ***rssi-BT***  This field provides the beacon received signal strength indicator (RSSI) in dBm as defined in TS 36.355 [54]. |

#### – *LogMeasResultListWLAN*

The IE *LogMeasResultListWLAN* covers measured results for WLAN.

*LogMeasResultListWLAN* information element

-- ASN1START

LogMeasResultListWLAN-r15 ::= SEQUENCE (SIZE (1..maxWLAN-Id-Report-r14)) OF LogMeasResultWLAN-r15

LogMeasResultWLAN-r15 ::= SEQUENCE {

wlan-Identifiers-r15 WLAN-Identifiers-r12,

rssiWLAN-r15 WLAN-RSSI-Range-r13 OPTIONAL,

rtt-WLAN-r15 WLAN-RTT-r15 OPTIONAL,

...

}

-- ASN1STOP

| *LogMeasResultListWLAN* field descriptions |
| --- |
| ***rssiWLAN***  Measured WLAN RSSI result in dBm. |
| ***rtt-WLAN***  This field provides the measured round trip time between the target device and WLAN AP and optionally the accuracy expressed as the standard deviation of the delay. Units for each of these are 1000ns, 100ns, 10ns, 1ns, and 0.1ns as defined in TS 36.355 [54]. |
| ***wlan-Identifiers***  Indicates the WLAN parameters used for identification of the WLAN for which the measurement results are applicable. |

#### – *MaxRS-IndexCellQualNR*

The IE *MaxRS-IndexCellQualNR* indicates the maximum number of RS indices to be considered/ averaged to derive the cell quality for RRM.

*MaxRS-IndexCellQualNR* information element

-- ASN1START

MaxRS-IndexCellQualNR-r15::= INTEGER (1..maxRS-IndexCellQual-r15)

-- ASN1STOP

#### – *MBSFN-RSRQ-Range*

The IE *MBSFN-RSRQ-Range* specifies the value range used in MBSFN RSRQ measurements. Integer value for MBSFN RSRQ measurements according to mapping table in TS 36.133 [16].

*MBSFN-RSRQ-Range* information element

-- ASN1START

MBSFN-RSRQ-Range-r12 ::= INTEGER(0..31)

-- ASN1STOP

#### – *MeasConfig*

The IE *MeasConfig* specifies measurements to be performed by the UE, and covers intra-frequency, inter-frequency and inter-RAT mobility as well as configuration of measurement gaps.

*MeasConfig* information element

-- ASN1START

MeasConfig ::= SEQUENCE {

-- Measurement objects

measObjectToRemoveList MeasObjectToRemoveList OPTIONAL, -- Need ON

measObjectToAddModList MeasObjectToAddModList OPTIONAL, -- Need ON

-- Reporting configurations

reportConfigToRemoveList ReportConfigToRemoveList OPTIONAL, -- Need ON

reportConfigToAddModList ReportConfigToAddModList OPTIONAL, -- Need ON

-- Measurement identities

measIdToRemoveList MeasIdToRemoveList OPTIONAL, -- Need ON

measIdToAddModList MeasIdToAddModList OPTIONAL, -- Need ON

-- Other parameters

quantityConfig QuantityConfig OPTIONAL, -- Need ON

measGapConfig MeasGapConfig OPTIONAL, -- Need ON

s-Measure RSRP-Range OPTIONAL, -- Need ON

preRegistrationInfoHRPD PreRegistrationInfoHRPD OPTIONAL, -- Need OP

speedStatePars CHOICE {

release NULL,

setup SEQUENCE {

mobilityStateParameters MobilityStateParameters,

timeToTrigger-SF SpeedStateScaleFactors

}

} OPTIONAL, -- Need ON

...,

[[ measObjectToAddModList-v9e0 MeasObjectToAddModList-v9e0 OPTIONAL -- Need ON

]],

[[ allowInterruptions-r11 BOOLEAN OPTIONAL -- Need ON

]],

[[ measScaleFactor-r12 CHOICE {

release NULL,

setup MeasScaleFactor-r12

} OPTIONAL, -- Need ON

measIdToRemoveListExt-r12 MeasIdToRemoveListExt-r12 OPTIONAL, -- Need ON

measIdToAddModListExt-r12 MeasIdToAddModListExt-r12 OPTIONAL, -- Need ON

measRSRQ-OnAllSymbols-r12 BOOLEAN OPTIONAL -- Need ON

]],

[[

measObjectToRemoveListExt-r13 MeasObjectToRemoveListExt-r13 OPTIONAL, -- Need ON

measObjectToAddModListExt-r13 MeasObjectToAddModListExt-r13 OPTIONAL, -- Need ON

measIdToAddModList-v1310 MeasIdToAddModList-v1310 OPTIONAL, -- Need ON

measIdToAddModListExt-v1310 MeasIdToAddModListExt-v1310 OPTIONAL -- Need ON

]],

[[ measGapConfigPerCC-List-r14 MeasGapConfigPerCC-List-r14 OPTIONAL, -- Need ON

measGapSharingConfig-r14 MeasGapSharingConfig-r14 OPTIONAL -- Need ON

]],

[[ fr1-Gap-r15 BOOLEAN OPTIONAL, -- Need ON

mgta-r15 BOOLEAN OPTIONAL -- Need ON

]],

[[ measGapConfigDensePRS-r15 MeasGapConfigDensePRS-r15 OPTIONAL, -- Need ON

heightThreshRef-r15 CHOICE {

release NULL,

setup INTEGER (0..31)

} OPTIONAL --Need ON

]]

}

MeasIdToRemoveList ::= SEQUENCE (SIZE (1..maxMeasId)) OF MeasId

MeasIdToRemoveListExt-r12 ::= SEQUENCE (SIZE (1..maxMeasId)) OF MeasId-v1250

MeasObjectToRemoveList ::= SEQUENCE (SIZE (1..maxObjectId)) OF MeasObjectId

MeasObjectToRemoveListExt-r13 ::= SEQUENCE (SIZE (1..maxObjectId)) OF MeasObjectId-v1310

ReportConfigToRemoveList ::= SEQUENCE (SIZE (1..maxReportConfigId)) OF ReportConfigId

-- ASN1STOP

| *MeasConfig* field descriptions |
| --- |
| ***allowInterruptions***  Value TRUE indicates that the UE is allowed to cause interruptions to serving cells when performing measurements of deactivated SCell carriers for *measCycleSCell* of less than 640ms, as specified in TS 36.133 [16]. E-UTRAN enables this field only when an SCell is configured. |
| ***fr1-Gap***  Indicates whether the gap is only applicable for measurements on FR1. E-UTRAN sets this field to *TRUE* only when the UE is configured with (NG)EN-DC. |
| ***heightThreshRef***  Reference height threshold for *eventH1* and *eventH2* in *reportConfig*. Value 0 refers to -420m, value 1 refers to –120m, and so on until value 30 refers to 8880m. The actual value is height in meters relative to sea level. Value 31 is reserved. |
| ***measGapConfig***  Used to setup and release measurement gaps. E-UTRAN includes either *measGapConfig* or *measGapConfigPerCC-List*, if any. |
| ***measGapConfigDensePRS***  Used to setup and release additional measurement gap pattern with dense PRS configuration as specified in TS 36.133 [16], Table 8.1.2.1-3. E-UTRAN configures this field only when UE indicates the preference of measurement gap configuration for dense PRS, i.e., *measPRS-Offset-r15.* |
| ***measGapConfigPerCC-List***  Used to setup and release serving cell sepecific measurement gaps. E-UTRAN includes either *measGapConfig* or *measGapConfigPerCC*-List, if any. |
| ***measGapSharingConfig***  Used to setup and release measurement gap sharing for intra- and inter-frequency measurement as specified in TS 36.133 [16]. |
| ***measIdToAddModList***  List of measurement identities. Field *measIdToAddModListExt* includes additional measurement identities i.e. extends the size of the measurement identity list using the general principles specified in 5.1.2. If E-UTRAN includes *measIdToAddModList-v1310* it includes the same number of entries, and listed in the same order, as in *measIdToAddModList* (i.e. without suffix). If E-UTRAN includes *measIdToAddModListExt-v1310,* it includes the same number of entries, and listed in the same order, as in *measIdToAddModListExt-r12.* |
| ***measIdToRemoveList***  List of measurement identities to remove. Field *measIdToRemoveListExt* includes additional measurement identities i.e. extends the size of the measurement identity list using the general principles specified in 5.1.2. |
| ***measObjectToAddModList***  If E-UTRAN includes *measObjectToAddModList-v9e0* it includes the same number of entries, and listed in the same order, as in *measObjectToAddModList* (i.e. without suffix). Field *measObjectToAddModListExt* includes additional measurement object identities i.e. extends the size of the measurement object identity list using the general principles specified in 5.1.2. |
| ***measObjectToRemoveList***  List of measurement objects to remove. Field *measObjectToRemoveListExt* includes additional measurement object identities i.e. extends the size of the measurement object identity list using the general principles specified in 5.1.2. |
| ***measRSRQ-OnAllSymbols***  Value *TRUE* indicates that the UE shall, when performing RSRQ measurements, perform RSRQ measurement on all OFDM symbols in accordance with TS 36.214 [48]. If *widebandRSRQ-Meas* is enabled for the frequency in *MeasObjectEUTRA,* the UE shall, when performing RSRQ measurements, perform RSRQ measurement on all OFDM symbols with wider bandwidth for concerned frequency in accordance with TS 36.214 [48]. |
| ***measScaleFactor***  Even if *reducedMeasPerformance* is not included in any *measObjectEUTRA* or *measObjectUTRA*, E-UTRAN may configure this field. The UE behavior is specified in TS 36.133 [16]. |
| ***mgta***  Indicates whether a timing advance value of 0.5 ms is applicable to the measurement gap configuration provided by E-UTRAN according to TS 38.133 [84]. E-UTRAN sets *mgta* to TRUE only when the UE is configured to perform NR measurements. |
| ***preRegistrationInfoHRPD***  The CDMA2000 HRPD Pre-Registration Information tells the UE if it should pre-register with the CDMA2000 HRPD network and identifies the Pre-registration zone to the UE. |
| ***reportConfigToRemoveList***  List of measurement reporting configurations to remove. |
| ***s-Measure***  PCell (or PSCell, if the UE is in NE-DC) quality threshold controlling whether or not the UE is required to perform measurements of intra-frequency, inter-frequency and inter-RAT neighbouring cells. Value "0" indicates to disable *s-Measure*. |
| ***timeToTrigger-SF***  The *timeToTrigger* in *ReportConfigEUTRA* and in *ReportConfigInterRAT* are multiplied with the scaling factor applicable for the UE's speed state. |

#### *– MeasDS-Config*

The IE *MeasDS-Config* specifies information applicable for discovery signals measurement.

*MeasDS-Config* information elements

-- ASN1START

MeasDS-Config-r12 ::= CHOICE {

release NULL,

setup SEQUENCE {

dmtc-PeriodOffset-r12 CHOICE {

ms40-r12 INTEGER(0..39),

ms80-r12 INTEGER(0..79),

ms160-r12 INTEGER(0..159),

...

},

ds-OccasionDuration-r12 CHOICE {

durationFDD-r12 INTEGER(1..maxDS-Duration-r12),

durationTDD-r12 INTEGER(2..maxDS-Duration-r12)

},

measCSI-RS-ToRemoveList-r12 MeasCSI-RS-ToRemoveList-r12 OPTIONAL, -- Need ON

measCSI-RS-ToAddModList-r12 MeasCSI-RS-ToAddModList-r12 OPTIONAL, -- Need ON

...

}

}

MeasCSI-RS-ToRemoveList-r12 ::= SEQUENCE (SIZE (1..maxCSI-RS-Meas-r12)) OF MeasCSI-RS-Id-r12

MeasCSI-RS-ToAddModList-r12 ::= SEQUENCE (SIZE (1..maxCSI-RS-Meas-r12)) OF MeasCSI-RS-Config-r12

MeasCSI-RS-Id-r12 ::= INTEGER (1..maxCSI-RS-Meas-r12)

MeasCSI-RS-Config-r12 ::= SEQUENCE {

measCSI-RS-Id-r12 MeasCSI-RS-Id-r12,

physCellId-r12 INTEGER (0..503),

scramblingIdentity-r12 INTEGER (0..503),

resourceConfig-r12 INTEGER (0..31),

subframeOffset-r12 INTEGER (0..4),

csi-RS-IndividualOffset-r12 Q-OffsetRange,

...

}

-- ASN1STOP

| *MeasDS-Config* field descriptions |
| --- |
| ***csi-RS-IndividualOffset***  CSI-RS individual offset applicable to a specific CSI-RS resource. Value dB-24 corresponds to -24 dB, dB-22 corresponds to -22 dB and so on. |
| ***dmtc-PeriodOffset***  Indicates the discovery signals measurement timing configuration (DMTC) periodicity (*dmtc-Periodicity*) and offset (*dmtc-Offset*) for this frequency. For DMTC periodicity, value ms40 corresponds to 40ms, ms80 corresponds to 80ms and so on. The value of DMTC offset is in number of subframe(s). The duration of a DMTC occasion is 6ms. |
| ***ds-OccasionDuration***  Indicates the duration of discovery signal occasion for this frequency. Discovery signal occasion duration is common for all cells transmitting discovery signals on one frequency. If the *carrierFreq* in the measurement object is on an unlicensed band as specified in [42], the UE shall ignore the field *ds-OccasionDuration* for the carrier frequency and apply a value 1 instead. |
| ***measCSI-RS-ToAddModList***  List of CSI-RS resources to add/ modify in the CSI-RS resource list for discovery signals measurement. |
| ***measCSI-RS-ToRemoveList***  List of CSI-RS resources to remove from the CSI-RS resource list for discovery signals measurement. |
| ***physCellId***  Indicates the physical cell identity where UE may assume that the CSI-RS and the PSS/SSS/CRS corresponding to the indicated physical cell identity are quasi co-located with respect to average delay and doppler shift. |
| ***resourceConfig***  Parameter: CSI reference signal configuration, see TS 36.211 [21], tables 6.10.5.2-1 and 6.10.5.2-2. If the *carrierFreq* in the measurement object is on an unlicensed band as specified in TS 36.101 [42], E-UTRAN does not configure the values {0, 4, 5, 9, 10, 11, 18, 19}. |
| ***scramblingIdentity***  Parameter: Pseudo-random sequence generator parameter, , see TS 36.213 [23], clause 7.2.5. |
| ***subframeOffset***  Indicates the subframe offset between SSS of the cell indicated by physCellId and the CSI-RS resource in a discovery signal occasion. The field *subframeOffset* is set to values 0 if the *carrierFreq* in the measurement object is on an unlicensed band as specified in TS 36.101 [42]. |

#### – *MeasGapConfig*

The IE *MeasGapConfig* specifies the measurement gap configuration and controls setup/ release of measurement gaps.

*MeasGapConfig* information element

-- ASN1START

MeasGapConfig ::= CHOICE {

release NULL,

setup SEQUENCE {

gapOffset CHOICE {

gp0 INTEGER (0..39),

gp1 INTEGER (0..79),

...,

gp2-r14 INTEGER (0..39),

gp3-r14 INTEGER (0..79),

gp-ncsg0-r14 INTEGER (0..39),

gp-ncsg1-r14 INTEGER (0..79),

gp-ncsg2-r14 INTEGER (0..39),

gp-ncsg3-r14 INTEGER (0..79),

gp-nonUniform1-r14 INTEGER (0..1279),

gp-nonUniform2-r14 INTEGER (0..2559),

gp-nonUniform3-r14 INTEGER (0..5119),

gp-nonUniform4-r14 INTEGER (0..10239),

gp4-r15 INTEGER (0..19),

gp5-r15 INTEGER (0..159),

gp6-r15 INTEGER (0..19),

gp7-r15 INTEGER (0..39),

gp8-r15 INTEGER (0..79),

gp9-r15 INTEGER (0..159),

gp10-r15 INTEGER (0..19),

gp11-r15 INTEGER (0..159)

}

}

}

-- ASN1STOP

| *MeasGapConfig* field descriptions |
| --- |
| ***gapOffset***  Value *gapOffset* of *gp0* corresponds to gap offset of Gap Pattern Id "0" with MGRP = 40ms, *gapOffset* of *gp1* corresponds to gap offset of Gap Pattern Id "1" with MGRP = 80ms, *gapOffset* of *gp2* corresponds to gap offset of Gap Pattern Id "2" with MGRP = 40ms and MGL = 3ms, *gapOffset* of *gp3* Gap Pattern Id "3" with MGRP = 80ms and MGL = 3ms, *gapOffset* of *gp-ncsg0* corresponds to gap offset of NCSG Pattern Id "0" with VIRP = 40ms and ML = 4ms, *gapOffset* of *gp-ncsg1* corresponds to gap offset of of NCSG Pattern Id "1" with VIRP = 80ms and ML = 4ms, *gapOffset* of *gp-ncsg2* corresponds to gap offset of NCSG Pattern Id "2" with VIRP = 40ms and ML = 3ms, *gapOffset* of *gp-ncsg3* corresponds to gap offset of of NCSG Pattern Id "3" with VIRP = 80ms and ML =3ms. *gapOffset* of *gp-nonUniform1* corresponds to gap offset of non uniform gap pattern Id "1" with LMGRP = 1280ms, *gapOffset* of *gp-nonUniform2* corresponds to gap offset of non uniform gap pattern Id "2" with LMGRP = 2560ms, *gapOffset* of *gp-nonUniform3* corresponds to gap offset of non uniform gap pattern Id "3" with LMGRP = 5120ms, *gapOffset* of *gp-nonUniform4* corresponds to gap offset of non uniform gap pattern Id "4" with LMGRP = 10240ms. Also used to specify the measurement gap pattern to be applied, as defined in TS 36.133 [16]. For Gap Patterns (including non-uniform gap patterns, but excluding NCSG patterns), E-UTRAN includes the same *gapOffset* value (gap pattern id and gap offset) for all serving cells that are configured with a Gap Pattern. For NCSG Patterns, E-UTRAN includes *gapOffset* value indicating VIRP and gap offset consistent with the Gap Pattern configuration (MGRP and gap offset). Value gapOffset of *gp4, gp5*,…,*gp11* are corresponding to gap pattern with Gap Pattern ID 4, 5,..11 respectively, see TS 38.133 [84], Table 9.1.2-1. Value *gp4, gp5*, …, *gp11* can be applied for (NG)EN-DC, see TS 38.133 [84], Table 9.1.2-2. |
| ***servCellId***  Identifies the serving cell for which measurement gap configuration is provided (setup) or deleted (release). |

#### *– MeasGapConfigDensePRS*

The IE *MeasGapConfigDensePRS* specifies the additional measurement gap pattern configuration for RSTD measurements with dense PRS configuration, see TS 36.133 [16], Table 8.1.2.1-3. Measurement gaps are configured according to applicability rules specified in 36.133 [16], Table 8.1.2.1-3.

*MeasGapConfigDensePRS* information element

-- ASN1START

MeasGapConfigDensePRS-r15 ::= CHOICE {

release NULL,

setup SEQUENCE {

gapOffsetDensePRS-r15 CHOICE {

rstd0-r15 INTEGER (0..79),

rstd1-r15 INTEGER (0..159),

rstd2-r15 INTEGER (0..319),

rstd3-r15 INTEGER (0..639),

rstd4-r15 INTEGER (0..1279),

rstd5-r15 INTEGER (0..159),

rstd6-r15 INTEGER (0..319),

rstd7-r15 INTEGER (0..639),

rstd8-r15 INTEGER (0..1279),

rstd9-r15 INTEGER (0..319),

rstd10-r15 INTEGER (0..639),

rstd11-r15 INTEGER (0..1279),

rstd12-r15 INTEGER (0..319),

rstd13-r15 INTEGER (0..639),

rstd14-r15 INTEGER (0..1279),

rstd15-r15 INTEGER (0..639),

rstd16-r15 INTEGER (0..1279),

rstd17-r15 INTEGER (0..639),

rstd18-r15 INTEGER (0..1279),

rstd19-r15 INTEGER (0..639),

rstd20-r15 INTEGER (0..1279),

...

}

}

}

-- ASN1STOP

| *MeasGapConfigDensePRS* field descriptions |
| --- |
| ***gapOffsetDensePRS***  Indicates the gap offset for performing RSTD measurements with dense PRS configurations as specified in 5.5.2.9a corresponding to measurement gap pattern ID specified in TS 36.133 [16]. |

#### – *MeasGapConfigPerCC-List*

The IE *MeasGapConfigPerCC-List* specifies the measurement gap configuration and controls setup/ release of measurement gaps.

*MeasGapConfigPerCC-List* information element

-- ASN1START

MeasGapConfigPerCC-List-r14 ::= CHOICE {

release NULL,

setup SEQUENCE {

measGapConfigToRemoveList-r14 MeasGapConfigToRemoveList-r14 OPTIONAL, -- Need ON

measGapConfigToAddModList-r14 MeasGapConfigToAddModList-r14 OPTIONAL -- Need ON

}

}

MeasGapConfigToRemoveList-r14 ::= SEQUENCE (SIZE (1..maxServCell-r13)) OF ServCellIndex-r13

MeasGapConfigToAddModList-r14 ::= SEQUENCE (SIZE (1..maxServCell-r13)) OF MeasGapConfigPerCC-r14

MeasGapConfigPerCC-r14 ::= SEQUENCE {

servCellId-r14 ServCellIndex-r13,

measGapConfigCC-r14 MeasGapConfig

}

-- ASN1STOP

| *MeasGapConfigPerCC-List* field descriptions |
| --- |
| ***measGapConfigToAddModList***  List of serving cells and corresponding serving cell specific measurement gap configuration to add /modify. |
| ***measGapConfigToRemoveList***  List of serving cells for which measurement gap configuration is removed. |

#### – *MeasGapSharingConfig*

The IE *MeasGapSharingConfig* specifies the measurement gap sharing scheme and controls setup/ release of measurement gap sharing.

*MeasGapSharingConfig* information element

-- ASN1START

MeasGapSharingConfig-r14 ::= CHOICE {

release NULL,

setup SEQUENCE {

measGapSharingScheme-r14 ENUMERATED {scheme00, scheme01, scheme10, scheme11}

}

}

-- ASN1STOP

| *MeasGapSharingConfig* field descriptions |
| --- |
| ***measGapSharingScheme***  Indicates the measurement gaps sharing scheme for BL UEs in CE mode A and CE mode B and for (NG)EN-DC (for the measurement gap configured by E-UTRAN). For BL UEs, see TS 36.133 [16], Table 8.13.2.1.1.1-2 and Table 8.13.3.1.1.1-3. For (NG)EN-DC, see TS 36.133 [16], Table 8.17.1.1-1. Value *scheme00* corresponds to "00", value *scheme01* corresponds to "01", and so on. |

#### – *MeasId*

The IE *MeasId* is used to identify a measurement configuration, i.e., linking of a measurement object and a reporting configuration.

*MeasId* information element

-- ASN1START

MeasId ::= INTEGER (1..maxMeasId)

MeasId-v1250 ::= INTEGER (maxMeasId-Plus1..maxMeasId-r12)

-- ASN1STOP

#### – *MeasIdleConfig*

The IE *MeasIdleConfig* is used to convey information to UE about measurements requested to be done while in RRC\_IDLE or RRC\_INACTIVE.

*MeasIdleConfig* information element

-- ASN1START

MeasIdleConfigSIB-r15 ::= SEQUENCE {

measIdleCarrierListEUTRA-r15 EUTRA-CarrierList-r15,

...

}

MeasIdleConfigSIB-NR-r16 ::= SEQUENCE {

measIdleCarrierListNR-r16 NR-CarrierList-r16,

...

}

MeasIdleConfigDedicated-r15 ::= SEQUENCE {

measIdleCarrierListEUTRA-r15 EUTRA-CarrierList-r15 OPTIONAL, -- Need OR

measIdleDuration-r15 ENUMERATED {sec10, sec30, sec60, sec120,

sec180, sec240, sec300, spare},

...,

[[

measIdleCarrierListNR-r16 NR-CarrierList-r16 OPTIONAL, -- Need OR

validityAreaList-r16 ValidityAreaList-r16 OPTIONAL -- Need OR

]]

}

EUTRA-CarrierList-r15 ::= SEQUENCE (SIZE (1..maxFreqIdle-r15)) OF MeasIdleCarrierEUTRA-r15

NR-CarrierList-r16 ::= SEQUENCE (SIZE (1..maxFreqIdle-r15)) OF MeasIdleCarrierNR-r16

MeasIdleCarrierEUTRA-r15::= SEQUENCE {

carrierFreq-r15 ARFCN-ValueEUTRA-r9,

allowedMeasBandwidth-r15 AllowedMeasBandwidth,

validityArea-r15 CellList-r15 OPTIONAL, -- Need OR

measCellList-r15 CellList-r15 OPTIONAL, -- Need OR

reportQuantities ENUMERATED {rsrp, rsrq, both},

qualityThreshold-r15 SEQUENCE {

idleRSRP-Threshold-r15 RSRP-Range OPTIONAL, -- Need OR

idleRSRQ-Threshold-r15 RSRQ-Range-r13 OPTIONAL -- Need OR

} OPTIONAL, -- Need OP

...

}

ValidityAreaList-r16 ::= SEQUENCE (SIZE (1..maxFreqIdle-r15)) OF ValidityArea-r16

ValidityArea-r16 ::= SEQUENCE {

carrierFreq-r16 ARFCN-ValueEUTRA-r9,

validityCellList-r16 ValidityCellList-r16 OPTIONAL -- Need ON

}

ValidityCellList-r16 ::= SEQUENCE (SIZE (1.. maxCellMeasIdle-r15)) OF PhysCellIdRange

MeasIdleCarrierNR-r16 ::= SEQUENCE {

carrierFreqNR-r16 ARFCN-ValueNR-r15,

subcarrierSpacingSSB-r16 ENUMERATED {kHz15, kHz30, kHz120, kHz240},

frequencyBandList MultiFrequencyBandListNR-r15 OPTIONAL, -- Need OR

measCellListNR-r16 CellListNR-r16 OPTIONAL, -- Need OR

reportQuantitiesNR-r16 ENUMERATED {rsrp, rsrq, both},

qualityThresholdNR-r16 SEQUENCE {

idleRSRP-ThresholdNR-r16 RSRP-RangeNR-r15 OPTIONAL, -- Need OR

idleRSRQ-ThresholdNR-r16 RSRQ-RangeNR-r15 OPTIONAL -- Need OR

} OPTIONAL, -- Need OR

ssb-MeasConfig-r16 SEQUENCE {

maxRS-IndexCellQual-r16 MaxRS-IndexCellQualNR-r15 OPTIONAL, -- Need OR

threshRS-Index-r16 ThresholdListNR-r15 OPTIONAL, -- Need OR

measTimingConfig-r16 MTC-SSB-NR-r15 OPTIONAL, -- Need OR

ssb-ToMeasure-r16 SSB-ToMeasure-r15 OPTIONAL, -- Need OR

deriveSSB-IndexFromCell-r16 BOOLEAN,

ss-RSSI-Measurement-r16 SS-RSSI-Measurement-r15 OPTIONAL -- Need OP

} OPTIONAL, -- Need OP

beamMeasConfigIdle-r16 BeamMeasConfigIdleNR-r16 OPTIONAL, -- Need OR

...

}

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

CellListNR-r16 ::= SEQUENCE (SIZE (1..maxCellMeasIdle-r15)) OF PhysCellIdRangeNR-r16

BeamMeasConfigIdleNR-r16 ::= SEQUENCE {

reportQuantityRS-IndexNR-r16 ENUMERATED {rsrp, rsrq, both},

maxReportRS-Index-r16 INTEGER (0..maxRS-IndexReport-r15),

reportRS-IndexResultsNR-r16 BOOLEAN

}

-- ASN1STOP

| *MeasIdleConfig* field descriptions |
| --- |
| ***allowedMeasBandwidth***  If absent, the value corresponding to the downlink bandwidth indicated by the *dl-Bandwidt*h included in *MasterInformationBlock* of serving cell applies. |
| ***beamMeasConfigIdle***  Indicates the beam level measurement configuration. |
| ***carrierFreq***  Indicates the E-UTRA carrier frequency to be used for measurements during RRC\_IDLE or RRC\_INACTIVE. |
| ***carrierFreqNR***  Indicates the NR carrier frequency to be used for measurements during RRC\_IDLE or RRC\_INACTIVE. |
| ***frequencyBandList***  Indicates the list of frequency bands for which the NR idle/inactive measurement parameters apply. The UE shall select the first listed band which it supports in the frequencyBandList field to represent the NR neighbour carrier frequency. |
| ***deriveSSB-IndexFromCell***  The field indicates whether the UE may use, to derive the SSB index of a cell on the indicated SSB frequency and subcarrier spacing, the timing of any detected cell with the same SSB frequency and subcarrier spacing. If this field is set to TRUE, the UE assumes SFN and frame boundary alignment across cells on the same NR carrier frequency as specified in TS 36.133 [16]. |
| ***maxReportRS-Index***  Max number of beam indices to include in the idle/inactive measurement result. |
| ***maxRS-IndexCellQual***  Number of SS blocks to average for cell measurement derivation. Corresponds to the parameter *nrofSS-BlocksToAverage* in TS 38.304 [92]. |
| ***measCellList***  Indicates the list of E-UTRA cells which the UE is requested to measure and report for idle/inactive measurements. |
| ***measCellListNR***  Indicates the list of NR cells which the UE is requested to measure and report for idle/inactive measurements. |
| ***measIdleCarrierListEUTRA***  Indicates the E-UTRA carriers to be measured during RRC\_IDLE or RRC\_INACTIVE. |
| ***measIdleCarrierListNR***  Indicates the NR carriers to be measured during RRC\_IDLE or RRC\_INACTIVE. |
| ***measIdleDuration***  Indicates the duration for performing measurements during RRC\_IDLE or RRC\_INACTIVE for measurements assigned via *RRCConnectionRelease*. Value sec10 correspond to 10 seconds, value sec30 to 30 seconds and so on. |
| ***measTimingConfig***  Used to configure the NR measurement timing configurations, i.e., timing occasions at which the UE measures SSBs. If the field is absent in *VarMeasConfig*, the UE assumes that SSB periodicity is 5ms in this frequency. |
| ***qualityThreshold***  Indicates the quality thresholds for reporting the measured cells for idle/inactive E-UTRA measurements. |
| ***qualityThresholdNR***  Indicates the quality thresholds for reporting the measured cells for idle/inactive NR measurements. |
| ***reportQuantities***  Indicates which E-UTRA measurement quantities the UE is requested to report in the idle/inactive measurement report. In this version of the specification, E-UTRAN always configures the value '*both*'. |
| ***reportQuantitiesNR***  Indicates which NR measurement quantities the UE is requested to report in the idle/inactive measurement report. |
| ***reportQuantityRS-IndexNR***  Indicates which measurement information per beam index the UE shall include in the NR idle/inactive measurement results. |
| ***reportRS-IndexResultsNR***  Indicates whether or not the UE shall include beam measurements in the NR idle/inactive measurement results. |
| ***ss-RSSI-Measurement***  Indicates the SSB-based RSSI measurement configuration. If the field is absent in *VarMeasConfig*, the UE behaviour is defined in TS 38.215 [89], clause 5.1.3. |
| ***ssb-ToMeasure***  The set of SS blocks to be measured within the SMTC measurement duration (see TS 38.215 [89]). When the field is absent in *VarMeasConfig,* the UE measures on all SS-blocks. |
| ***subcarrierSpacingSSB***  Indicates subcarrier spacing of SSB of NR frequency. |
| ***threshRS-Index***  List of thresholds for consolidation of L1 measurements per RS index. Corresponds to the *parameter absThreshSS-BlocksConsolidation* in TS 38.304 [92]. |
| ***validityArea***  Indicates the list of cells within which UE is requested to do measurements during RRC\_IDLE or RRC\_INACTIVE. If the UE reselects to a cell whose physical cell identity does not match any entry in *validityArea* for the corresponding carrier frequency, the measurements are no longer required. E-UTRAN configures this field only in *RRCConnectionRelease*. |
| ***validityAreaList***  Indicates the list of frequencies and optionally, for each frequency, a list of cells within which the UE is required to perform measurements during RRC\_IDLE or RRC\_INACTIVE. E-UTRAN configures this field only in *RRCConnectionRelease*. A UE can be configured either with *validityArea* or *validityAreaList*, but not both. |

#### – *MeasIdToAddModList*

The IE *MeasIdToAddModList* concerns a list of measurement identities to add or modify, with for each entry the *measId*, the associated *measObjectId* and the associated *reportConfigId*. Field *measIdToAddModListExt* includes additional measurement identities i.e. extends the size of the measurement identity list using the general principles specified in 5.1.2.

*MeasIdToAddModList* information element

-- ASN1START

MeasIdToAddModList ::= SEQUENCE (SIZE (1..maxMeasId)) OF MeasIdToAddMod

MeasIdToAddModList-v1310 ::= SEQUENCE (SIZE (1..maxMeasId)) OF MeasIdToAddMod-v1310

MeasIdToAddModListExt-r12 ::= SEQUENCE (SIZE (1..maxMeasId)) OF MeasIdToAddModExt-r12

MeasIdToAddModListExt-v1310 ::= SEQUENCE (SIZE (1..maxMeasId)) OF MeasIdToAddMod-v1310

MeasIdToAddMod ::= SEQUENCE {

measId MeasId,

measObjectId MeasObjectId,

reportConfigId ReportConfigId

}

MeasIdToAddModExt-r12 ::= SEQUENCE {

measId-v1250 MeasId-v1250,

measObjectId-r12 MeasObjectId,

reportConfigId-r12 ReportConfigId

}

MeasIdToAddMod-v1310 ::= SEQUENCE {

measObjectId-v1310 MeasObjectId-v1310 OPTIONAL

}

-- ASN1STOP

|  |
| --- |
| *MeasIdToAddModList* field descriptions |
| ***measObjectId***  If the *measObjectId-v1310* is included, the *measObjectId* or *measObjectId-r12* is ignored by the UE. |

#### – *MeasObjectCDMA2000*

The IE *MeasObjectCDMA2000* specifies information applicable for inter-RAT CDMA2000 neighbouring cells.

*MeasObjectCDMA2000* information element

-- ASN1START

MeasObjectCDMA2000 ::= SEQUENCE {

cdma2000-Type CDMA2000-Type,

carrierFreq CarrierFreqCDMA2000,

searchWindowSize INTEGER (0..15) OPTIONAL, -- Need ON

offsetFreq Q-OffsetRangeInterRAT DEFAULT 0,

cellsToRemoveList CellIndexList OPTIONAL, -- Need ON

cellsToAddModList CellsToAddModListCDMA2000 OPTIONAL, -- Need ON

cellForWhichToReportCGI PhysCellIdCDMA2000 OPTIONAL, -- Need ON

...

}

CellsToAddModListCDMA2000 ::= SEQUENCE (SIZE (1..maxCellMeas)) OF CellsToAddModCDMA2000

CellsToAddModCDMA2000 ::= SEQUENCE {

cellIndex INTEGER (1..maxCellMeas),

physCellId PhysCellIdCDMA2000

}

-- ASN1STOP

| *MeasObjectCDMA2000* field descriptions |
| --- |
| ***carrierInfo***  Identifies CDMA2000 carrier frequency for which this configuration is valid. |
| ***cdma2000-Type***  The type of CDMA2000 network: CDMA2000 1xRTT or CDMA2000 HRPD. |
| ***cellIndex***  Entry index in the neighbouring cell list. |
| ***cellsToAddModList***  List of cells to add/ modify in the neighbouring cell list. |
| ***cellsToRemoveList***  List of cells to remove from the neighbouring cell list. |
| ***physCellId***  CDMA2000 Physical cell identity of a cell in neighbouring cell list expressed as PNOffset. |
| ***searchWindowSize***  Provides the search window size to be used by the UE for the neighbouring pilot, see C.S0005 [25]. |

#### – *MeasObjectEUTRA*

The IE *MeasObjectEUTRA* specifies information applicable for intra-frequency or inter-frequency E‑UTRA cells.

*MeasObjectEUTRA* information element

-- ASN1START

MeasObjectEUTRA ::= SEQUENCE {

carrierFreq ARFCN-ValueEUTRA,

allowedMeasBandwidth AllowedMeasBandwidth,

presenceAntennaPort1 PresenceAntennaPort1,

neighCellConfig NeighCellConfig,

offsetFreq Q-OffsetRange DEFAULT dB0,

-- Cell list

cellsToRemoveList CellIndexList OPTIONAL, -- Need ON

cellsToAddModList CellsToAddModList OPTIONAL, -- Need ON

-- Excluded list

excludedCellsToRemoveList CellIndexList OPTIONAL, -- Need ON

excludedCellsToAddModList ExcludedCellsToAddModList OPTIONAL, -- Need ON

cellForWhichToReportCGI PhysCellId OPTIONAL, -- Need ON

...,

[[measCycleSCell-r10 MeasCycleSCell-r10 OPTIONAL, -- Need ON

measSubframePatternConfigNeigh-r10 MeasSubframePatternConfigNeigh-r10 OPTIONAL -- Need ON

]],

[[widebandRSRQ-Meas-r11 BOOLEAN OPTIONAL -- Cond WB-RSRQ

]],

[[ altTTT-CellsToRemoveList-r12 CellIndexList OPTIONAL, -- Need ON

altTTT-CellsToAddModList-r12 AltTTT-CellsToAddModList-r12 OPTIONAL, -- Need ON

t312-r12 CHOICE {

release NULL,

setup ENUMERATED {ms0, ms50, ms100, ms200,

ms300, ms400, ms500, ms1000}

} OPTIONAL, -- Need ON

reducedMeasPerformance-r12 BOOLEAN OPTIONAL, -- Need ON

measDS-Config-r12 MeasDS-Config-r12 OPTIONAL -- Need ON

]],

[[

allowedCellsToRemoveList-r13 CellIndexList OPTIONAL, -- Need ON

allowedCellsToAddModList-r13 AllowedCellsToAddModList-r13 OPTIONAL, -- Need ON

rmtc-Config-r13 RMTC-Config-r13 OPTIONAL, -- Need ON

carrierFreq-r13 ARFCN-ValueEUTRA-v9e0 OPTIONAL -- Need ON

]],

[[

tx-ResourcePoolToRemoveList-r14 Tx-ResourcePoolMeasList-r14 OPTIONAL, -- Need ON

tx-ResourcePoolToAddList-r14 Tx-ResourcePoolMeasList-r14 OPTIONAL, -- Need ON

fembms-MixedCarrier-r14 BOOLEAN OPTIONAL -- Need ON

]],

[[

measSensing-Config-r15 MeasSensing-Config-r15 OPTIONAL -- Need ON

]],

[[

measRSS-DedicatedConfig-r16 SetupRelease {MeasRSS-DedicatedConfig-r16} OPTIONAL -- Need ON

]]

}

MeasObjectEUTRA-v9e0 ::= SEQUENCE {

carrierFreq-v9e0 ARFCN-ValueEUTRA-v9e0

}

MeasRSS-DedicatedConfig-r16 ::= SEQUENCE {

rss-ConfigCarrierInfo-r16 RSS-ConfigCarrierInfo-r16 OPTIONAL, -- Need OP

cellsToAddModList-v1610 CellsToAddModList-v1610 OPTIONAL -- Need ON

}

CellsToAddModList ::= SEQUENCE (SIZE (1..maxCellMeas)) OF CellsToAddMod

CellsToAddModList-v1610 ::= SEQUENCE (SIZE (1..maxCellMeas)) OF CellsToAddMod-v1610

CellsToAddMod ::= SEQUENCE {

cellIndex INTEGER (1..maxCellMeas),

physCellId PhysCellId,

cellIndividualOffset Q-OffsetRange

}

CellsToAddMod-v1610 ::= SEQUENCE {

rss-MeasPowerBias-r16 RSS-MeasPowerBias-r16

}

ExcludedCellsToAddModList ::= SEQUENCE (SIZE (1..maxCellMeas)) OF ExcludedCellsToAddMod

ExcludedCellsToAddMod ::= SEQUENCE {

cellIndex INTEGER (1..maxCellMeas),

physCellIdRange PhysCellIdRange

}

MeasCycleSCell-r10 ::= ENUMERATED {sf160, sf256, sf320, sf512,

sf640, sf1024, sf1280, spare1}

MeasSubframePatternConfigNeigh-r10 ::= CHOICE {

release NULL,

setup SEQUENCE {

measSubframePatternNeigh-r10 MeasSubframePattern-r10,

measSubframeCellList-r10 MeasSubframeCellList-r10 OPTIONAL -- Cond always

}

}

MeasSubframeCellList-r10 ::= SEQUENCE (SIZE (1..maxCellMeas)) OF PhysCellIdRange

AltTTT-CellsToAddModList-r12 ::= SEQUENCE (SIZE (1..maxCellMeas)) OF AltTTT-CellsToAddMod-r12

AltTTT-CellsToAddMod-r12 ::= SEQUENCE {

cellIndex-r12 INTEGER (1..maxCellMeas),

physCellIdRange-r12 PhysCellIdRange

}

AllowedCellsToAddModList-r13 ::= SEQUENCE (SIZE (1..maxCellMeas)) OF AllowedCellsToAddMod-r13

AllowedCellsToAddMod-r13 ::= SEQUENCE {

cellIndex-r13 INTEGER (1..maxCellMeas),

physCellIdRange-r13 PhysCellIdRange

}

RMTC-Config-r13 ::= CHOICE {

release NULL,

setup SEQUENCE {

rmtc-Period-r13 ENUMERATED {ms40, ms80, ms160, ms320, ms640},

rmtc-SubframeOffset-r13 INTEGER(0..639) OPTIONAL, -- Need ON

measDuration-r13 ENUMERATED {sym1, sym14, sym28, sym42, sym70},

...

}

}

Tx-ResourcePoolMeasList-r14 ::= SEQUENCE (SIZE (1..maxSL-PoolToMeasure-r14)) OF SL-V2X-TxPoolReportIdentity-r14

-- ASN1STOP

| *MeasObjectEUTRA* field descriptions |
| --- |
| ***allowedCellsToAddModList***  List of cells to add/modify in the list of allow-listed cells. |
| ***allowedCellsToRemoveList***  List of cells to remove from the list of allow-listed cells. |
| ***altTTT-CellsToAddModList***  List of cells to add/ modify in the cell list for which the alternative time to trigger specified by *alternativeTimeToTrigger* in *reportConfigEUTRA*, if configured, applies. |
| ***altTTT-CellsToRemoveList***  List of cells to remove from the list of cells for alternative time to trigger. |
| ***carrierFreq***  Identifies E‑UTRA carrier frequency for which this configuration is valid. E-UTRAN does not configure more than one measurement object for the same physical frequency regardless of the E-ARFCN used to indicate this. CarrierFreq-r13 is included only when the extension list measObjectToAddModListExt-r13 is used. If *carrierFreq-r13* is present, *carrierFreq* (i.e., without suffix) shall be set to value *maxEARFCN*. |
| ***cellIndex***  Entry index in the cell list. An entry may concern a range of cells, in which case this value applies to the entire range. |
| ***cellIndividualOffset***  Cell individual offset applicable to a specific cell. Value dB-24 corresponds to -24 dB, dB-22 corresponds to -22 dB and so on. |
| ***cellsToAddModList***  List of cells to add/ modify in the cell list. *cellsToAddModList-v1610* indicates list of RSS assistance information which is used for the corresponding *physCellId*. If E-UTRAN includes *cellsToAddModList-v1610*, it includes the same number of entries, and listed in the same order, as in *cellsToAddModList* (i.e. without suffix)*.* |
| ***cellsToRemoveList***  List of cells to remove from the cell list. |
| ***excludedCellsToAddModList***  List of cells to add/ modify in the list of exclude-listed cells. |
| ***excludedCellsToRemoveList***  List of cells to remove from the list of exclude-listed cells. |
| ***fembms-MixedCarrier***  If this field is set to *TRUE*, the cells on the carrier frequency indicated by the *measObject* are FeMBMS/Unicast-mixed cells. |
| ***measCycleSCell***  The parameter is used only when an SCell is configured on the frequency indicated by the *measObject* and is in deactivated state, see TS 36.133 [16], clause 8.3.3. E-UTRAN configures the parameter whenever an SCell is configured on the frequency indicated by the *measObject*, but the field may also be signalled when an SCell is not configured. Value *sf160* corresponds to 160 sub-frames, *sf256* corresponds to 256 sub-frames and so on. |
| ***measDS-Config***  Parameters applicable to discovery signals measurement on the carrier frequency indicated by *carrierFreq*. |
| ***measDuration***  Number of consecutive symbols for which the Physical Layer reports samples of RSSI, see TS 36.214 [48]. Value *sym1* corresponds to one symbol, *sym14* corresponds to 14 symbols, and so on. |
| ***measRSS-DedicatedConfig***  The field indicates whether measurements based on RSS in RRC\_CONNECTED is enabled and provides neighbour cell RSS information. |
| ***measSubframeCellList***  List of cells for which *measSubframePatternNeigh* is applied. |
| ***measSubframePatternNeigh***  Time domain measurement resource restriction pattern applicable to neighbour cell RSRP and RSRQ measurements on the carrier frequency indicated by *carrierFreq*. For cells in *measSubframeCellList* the UE shall assume that the subframes indicated by *measSubframePatternNeigh* are non-MBSFN subframes, and have the same special subframe configuration as PCell. |
| ***offsetFreq***  Offset value applicable to the carrier frequency. Value dB-24 corresponds to -24 dB, dB-22 corresponds to -22 dB and so on. |
| ***physCellId***  Physical cell identity of a cell in the cell list. |
| ***physCellIdRange***  Physical cell identity or a range of physical cell identities. |
| ***reducedMeasPerformance***  If set to *TRUE*, the EUTRA carrier frequency is configured for reduced measurement performance, otherwise it is configured for normal measurement performance, see TS 36.133 [16]. |
| ***rmtc-Config***  Parameters applicable to RSSI and channel occupancy measurement on the carrier frequency indicated by *carrierFreq*. |
| ***rmtc-Period***  Indicates the RSSI measurement timing configuration (RMTC) periodicity for this frequency. Value *ms40* corresponds to 40 ms periodicity, *ms80* corresponds to 80 ms periodicity and so on, see TS 36.214 [48]. |
| ***rmtc-SubframeOffset***  Indicates the RSSI measurement timing configuration (RMTC) subframe offset for this frequency. The value of *rmtc-SubframeOffset* should be smaller than the value of *rmtc-Period*, see TS 36.214 [48]. For inter-frequency measurements, this field is optional present and if it is not configured, the UE chooses a random value as *rmtc-SubframeOffset* for *measDuration* which shall be selected to be between 0 and the configured *rmtc-Period* with equal probability. |
| ***rss-ConfigCarrierInfo***  RSS configurations for this carrier frequency. If absent, RSS is collocated (time and frequency domain) in all cells. |
| ***t312***  The value of timer T312. Value ms0 represents 0 ms, ms50 represents 50 ms and so on. |
| ***tx-ResourcePoolToAddList***  List of transmission pools identities to be added to the list of pools configured for CBR measurements and for which *poolReportId* is included in *SL-V2X-ConfigDedicated*, *SystemInformationBlockType21* or *SystemInformationBlockType26*. |
| t***x-ResourcePoolToRemoveList***  List of transmission resource pools identities to be removed from the list of pools configured for CBR measurements and for which *poolReportId* is included in *SL-V2X-ConfigDedicated*, *SystemInformationBlockType21* or *SystemInformationBlockType26*. |
| ***widebandRSRQ-Meas***  If this field is set to TRUE, the UE shall, when performing RSRQ measurements, use a wider bandwidth in accordance with TS 36.133 [16]. |

| Conditional presence | Explanation |
| --- | --- |
| *always* | The field is mandatory present. |
| *WB-RSRQ* | The field is optionally present, need ON, if the measurement bandwidth indicated by *allowedMeasBandwidth* is 50 resource blocks or larger; otherwise it is not present and the UE shall delete any existing value for this field, if configured. |

#### – *MeasObjectGERAN*

The IE *MeasObjectGERAN* specifies information applicable for inter-RAT GERAN neighbouring frequencies.

*MeasObjectGERAN* information element

-- ASN1START

MeasObjectGERAN ::= SEQUENCE {

carrierFreqs CarrierFreqsGERAN,

offsetFreq Q-OffsetRangeInterRAT DEFAULT 0,

ncc-Permitted BIT STRING(SIZE (8)) DEFAULT '11111111'B,

cellForWhichToReportCGI PhysCellIdGERAN OPTIONAL, -- Need ON

...

}

-- ASN1STOP

| *MeasObjectGERAN* field descriptions |
| --- |
| ***ncc-Permitted***  Field encoded as a bit map, where bit N is set to "0" if a BCCH carrier with NCC = N-1 is not permitted for monitoring and set to "1" if a BCCH carrier with NCC = N-1 is permitted for monitoring; N = 1 to 8; bit 1 of the bitmap is the leading bit of the bit string. |
| ***carrierFreqs***  If E-UTRAN includes *cellForWhichToReportCGI*, it includes only one GERAN ARFCN value in *carrierFreqs*. |

#### – *MeasObjectId*

The IE *MeasObjectId* used to identify a measurement object configuration.

*MeasObjectId* information element

-- ASN1START

MeasObjectId ::= INTEGER (1..maxObjectId)

MeasObjectId-v1310 ::= INTEGER (maxObjectId-Plus1-r13..maxObjectId-r13)

MeasObjectId-r13 ::= INTEGER (1..maxObjectId-r13)

-- ASN1STOP

#### – *MeasObjectNR*

The IE *MeasObjectNR* specifies information applicable for inter-RAT NR neighbouring cells.

*MeasObjectNR* information element

-- ASN1START

MeasObjectNR-r15 ::= SEQUENCE {

carrierFreq-r15 ARFCN-ValueNR-r15,

rs-ConfigSSB-r15 RS-ConfigSSB-NR-r15,

threshRS-Index-r15 ThresholdListNR-r15 OPTIONAL, -- Need OR

maxRS-IndexCellQual-r15 MaxRS-IndexCellQualNR-r15 OPTIONAL, -- Need OR

offsetFreq-r15 Q-OffsetRangeInterRAT DEFAULT 0,

excludedCellsToRemoveList-r15 CellIndexList OPTIONAL, -- Need ON

excludedCellsToAddModList-r15 CellsToAddModListNR-r15 OPTIONAL, -- Need ON

quantityConfigSet-r15 INTEGER (1.. maxQuantSetsNR-r15),

cellsForWhichToReportSFTD-r15 SEQUENCE (SIZE (1..maxCellSFTD)) OF PhysCellIdNR-r15 OPTIONAL, -- Need OR

...,

[[ cellForWhichToReportCGI-r15 PhysCellIdNR-r15 OPTIONAL, -- Need ON

deriveSSB-IndexFromCell-r15 BOOLEAN OPTIONAL, -- Need ON

ss-RSSI-Measurement-r15 SS-RSSI-Measurement-r15 OPTIONAL, -- Need ON

bandNR-r15 CHOICE {

release NULL,

setup FreqBandIndicatorNR-r15

} OPTIONAL -- Need ON

]],

[[

rmtc-ConfigNR-r16 SetupRelease {RMTC-ConfigNR-r16} OPTIONAL -- Cond SharedSpectrum

]]

}

RS-ConfigSSB-NR-r15 ::= SEQUENCE {

measTimingConfig-r15 MTC-SSB-NR-r15,

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

...,

[[ ssb-ToMeasure-r15 CHOICE {

release NULL,

setup SSB-ToMeasure-r15

} OPTIONAL -- Need ON

]],

[[

ssb-PositionQCL-CommonNR-r16 SSB-PositionQCL-RelationNR-r16 OPTIONAL, -- Cond SharedSpectrum2

ssb-PositionQCL-CellsToAddModListNR-r16 SSB-PositionQCL-CellsToAddModListNR-r16 OPTIONAL, -- Cond SharedSpectrum

ssb-PositionQCL-CellsToRemoveListNR-r16 SEQUENCE (SIZE (1..maxCellMeas)) OF PhysCellIdNR-r15 OPTIONAL -- Cond SharedSpectrum

]]

}

CellsToAddModListNR-r15 ::= SEQUENCE (SIZE (1..maxCellMeas)) OF CellsToAddModNR-r15

CellsToAddModNR-r15 ::= SEQUENCE {

cellIndex-r15 INTEGER (1..maxCellMeas),

physCellId-r15 PhysCellIdNR-r15

}

SSB-PositionQCL-CellsToAddModListNR-r16 ::= SEQUENCE (SIZE (1..maxCellMeas)) OF SSB-PositionQCL-CellsToAddNR-r16

SSB-PositionQCL-CellsToAddNR-r16 ::= SEQUENCE {

physCellId-r16 PhysCellIdNR-r15,

ssb-PositionQCL-NR-r16 SSB-PositionQCL-RelationNR-r16

}

RMTC-ConfigNR-r16 ::= SEQUENCE {

rmtc-PeriodicityNR-r16 ENUMERATED {ms40, ms80, ms160, ms320, ms640},

rmtc-SubframeOffsetNR-r16 INTEGER(0..639) OPTIONAL, -- Need ON

measDurationNR-r16 ENUMERATED {sym1, sym14or12, sym28or24, sym42or36, sym70or60},

rmtc-FrequencyNR-r16 ARFCN-ValueNR-r15,

refSCS-CP-NR-r16 ENUMERATED {kHz15, kHz30, kHz60-NCP, kHz60-ECP},

...

}

-- ASN1STOP

| *MeasObjectNR* field descriptions |
| --- |
| ***bandNR***  Indicates the frequency band of the NR carrier frequency configured in this *MeasObjectNR*. This field is always set to setup when the network configures measurements with this *MeasObjectNR*. |
| ***carrierFreq***  Identifies the SSB frequency to be measured. E-UTRAN does not configure more than one measurement object for the same SSB frequency. |
| ***deriveSSB-IndexFromCell***  The field indicates whether the UE may use, to derive the SSB index of a cell on the indicated SSB frequency and subcarrier spacing, the timing of the NR serving cell with the same SSB frequency and subcarrier spacing if configured. Otherwise, the field indicates whether the UE may use the timing of any detected cell with the same SSB frequency and subcarrier spacing. |
| ***measDurationNR***  Number of consecutive symbols for which the Physical Layer reports samples of RSSI (see TS 38.215 [89]). Value *sym1* corresponds to one symbol, *sym14or12* corresponds to 14 *symbols* of the reference numerology for NCP and 12 symbols for ECP, and so on. |
| ***quantityConfigSet***  Indicates the n-th element of *quantityConfigNRList* provided in *MeasConfig*. |
| ***refSCS-CP-NR***  Indicates a reference subcarrier spacing and cyclic prefix to be used for RSSI measurements (see TS 38.215 [89]). |
| ***rmtc-FrequencyNR***  Indicates the center frequency of the measured bandwidth (see TS 38.215 [89]). |
| ***rmtc-PeriodicityNR***  Indicates the RSSI measurement timing configuration (RMTC) periodicity (see TS 38.215 [89]). Value *ms40* corresponds to 40 ms periodicity, *ms80* corresponds to 80 ms periodicity, and so on. |
| ***rmtc-SubframeOffsetNR***  Indicates the RSSI measurement timing configuration (RMTC) subframe offset (see TS 38.215 [89)). If not configured, the UE chooses a random value as *rmtc-SubframeOffsetNR* for *measDurationNR* which shall be selected to be between 0 and the configured *rmtc-PeriodicityNR* with equal probability. |
| ***rs-ConfigSSB***  Indicates the SSB configuration for measuring the set of SS blocks within the SMTC measurement duration. |
| ***ssb-PositionQCL-NR***  Indicates the QCL relationship between SS/PBCH blocks for a specific neighbor cell as specified in TS 38.213 [88], clause 4.1. If provided, the cell specific value overwrites the common value signalled by *ssb-PositionQCL-CommonNR* in *MeasObjectNR* for the indicated cell. |
| ***ssb-PositionQCL-CommonNR***  Indicates the QCL relationship between SS/PBCH blocks for NR neighbor cells as specified in TS 38.213 [88], clause 4.1. |
| ***threshRS-Index***  List of thresholds for consolidation of L1 measurements per RS index. |

| Conditional presence | Explanation |
| --- | --- |
| *SharedSpectrum* | The field is optional Need ON if NR operates with shared spectrum channel access; otherwise, it is not present. |
| *SharedSpectrum2* | The field is mandatory present if NR operates with shared spectrum channel access; otherwise, it is not present. |

#### – *MeasObjectToAddModList*

The IE *MeasObjectToAddModList* concerns a list of measurement objects to add or modify

*MeasObjectToAddModList* information element

-- ASN1START

MeasObjectToAddModList ::= SEQUENCE (SIZE (1..maxObjectId)) OF MeasObjectToAddMod

MeasObjectToAddModListExt-r13 ::= SEQUENCE (SIZE (1..maxObjectId)) OF MeasObjectToAddModExt-r13

MeasObjectToAddModList-v9e0 ::= SEQUENCE (SIZE (1..maxObjectId)) OF MeasObjectToAddMod-v9e0

MeasObjectToAddMod ::= SEQUENCE {

measObjectId MeasObjectId,

measObject CHOICE {

measObjectEUTRA MeasObjectEUTRA,

measObjectUTRA MeasObjectUTRA,

measObjectGERAN MeasObjectGERAN,

measObjectCDMA2000 MeasObjectCDMA2000,

...,

measObjectWLAN-r13 MeasObjectWLAN-r13,

measObjectNR-r15 MeasObjectNR-r15

}

}

MeasObjectToAddModExt-r13 ::= SEQUENCE {

measObjectId-r13 MeasObjectId-v1310,

measObject-r13 CHOICE {

measObjectEUTRA-r13 MeasObjectEUTRA,

measObjectUTRA-r13 MeasObjectUTRA,

measObjectGERAN-r13 MeasObjectGERAN,

measObjectCDMA2000-r13 MeasObjectCDMA2000,

...,

measObjectWLAN-v1320 MeasObjectWLAN-r13,

measObjectNR-r15 MeasObjectNR-r15

}

}

MeasObjectToAddMod-v9e0 ::= SEQUENCE {

measObjectEUTRA-v9e0 MeasObjectEUTRA-v9e0 OPTIONAL -- Cond eutra

}

-- ASN1STOP

| Conditional presence | Explanation |
| --- | --- |
| *eutra* | The field is optional present, need OR, if for the corresponding entry in *MeasObjectToAddModList* or *MeasObjectToAddModListExt-r13* field *measObject* is set to *measObjectEUTRA* andits sub-field *carrierFreq* is set to *maxEARFCN*. Otherwise the field is not present and the UE shall delete any existing value for this field. |

#### – *MeasObjectUTRA*

The IE *MeasObjectUTRA* specifies information applicable for inter-RAT UTRA neighbouring cells.

*MeasObjectUTRA* information element

-- ASN1START

MeasObjectUTRA ::= SEQUENCE {

carrierFreq ARFCN-ValueUTRA,

offsetFreq Q-OffsetRangeInterRAT DEFAULT 0,

cellsToRemoveList CellIndexList OPTIONAL, -- Need ON

cellsToAddModList CHOICE {

cellsToAddModListUTRA-FDD CellsToAddModListUTRA-FDD,

cellsToAddModListUTRA-TDD CellsToAddModListUTRA-TDD

} OPTIONAL, -- Need ON

cellForWhichToReportCGI CHOICE {

utra-FDD PhysCellIdUTRA-FDD,

utra-TDD PhysCellIdUTRA-TDD

} OPTIONAL, -- Need ON

...,

[[ csg-allowedReportingCells-v930 CSG-AllowedReportingCells-r9 OPTIONAL -- Need ON

]],

[[ reducedMeasPerformance-r12 BOOLEAN OPTIONAL -- Need ON

]]

}

CellsToAddModListUTRA-FDD ::= SEQUENCE (SIZE (1..maxCellMeas)) OF CellsToAddModUTRA-FDD

CellsToAddModUTRA-FDD ::= SEQUENCE {

cellIndex INTEGER (1..maxCellMeas),

physCellId PhysCellIdUTRA-FDD

}

CellsToAddModListUTRA-TDD ::= SEQUENCE (SIZE (1..maxCellMeas)) OF CellsToAddModUTRA-TDD

CellsToAddModUTRA-TDD ::= SEQUENCE {

cellIndex INTEGER (1..maxCellMeas),

physCellId PhysCellIdUTRA-TDD

}

CSG-AllowedReportingCells-r9 ::= SEQUENCE {

physCellIdRangeUTRA-FDDList-r9 PhysCellIdRangeUTRA-FDDList-r9 OPTIONAL -- Need OR

}

-- ASN1STOP

| *MeasObjectUTRA* field descriptions |
| --- |
| ***carrierFreq***  Identifies UTRA carrier frequency for which this configuration is valid. E-UTRAN does not configure more than one measurement object for the same physical frequency regardless of the ARFCN used to indicate this. |
| ***cellIndex***  Entry index in the neighbouring cell list. |
| ***cellsToAddModListUTRA-FDD***  List of UTRA FDD cells to add/ modify in the neighbouring cell list. |
| ***cellsToAddModListUTRA-TDD***  List of UTRA TDD cells to add/modify in the neighbouring cell list. |
| ***cellsToRemoveList***  List of cells to remove from the neighbouring cell list. |
| ***csg-allowedReportingCells***  One or more ranges of physical cell identities for which UTRA-FDD reporting is allowed. |
| ***reducedMeasPerformance***  If set to *TRUE* the UTRA carrier frequency is configured for reduced measurement performance, otherwise it is configured for normal measurement performance, see TS 36.133 [16]. |

#### – *MeasObjectWLAN*

The IE *MeasObjectWLAN* specifies information applicable for inter-RAT WLAN measurements. E-UTRAN configures at least one WLAN identifier in the *MeasObjectWLAN*.

-- ASN1START

MeasObjectWLAN-r13 ::= SEQUENCE {

carrierFreq-r13 CHOICE {

bandIndicatorListWLAN-r13 SEQUENCE (SIZE (1..maxWLAN-Bands-r13)) OF WLAN-BandIndicator-r13,

carrierInfoListWLAN-r13 SEQUENCE (SIZE (1..maxWLAN-CarrierInfo-r13)) OF WLAN-CarrierInfo-r13

} OPTIONAL, -- Need ON

wlan-ToAddModList-r13 WLAN-Id-List-r13 OPTIONAL, -- Need ON

wlan-ToRemoveList-r13 WLAN-Id-List-r13 OPTIONAL, -- Need ON

...

}

WLAN-BandIndicator-r13 ::= ENUMERATED {band2dot4, band5, band60-v1430, spare5, spare4, spare3, spare2, spare1, ...}

-- ASN1STOP

| ***MeasObjectWLAN* field descriptions** |
| --- |
| ***bandIndicatorListWLAN***  Includes the list of WLAN bands. Value band2dot4 indicates the 2.4GHz band, value band5 indicates the 5GHz band and value band60 indicates the 60GHz band. |
| ***carrierInfoListWLAN***  Includes the list of WLAN carrier information for the measurement object. |
| ***wlan-ToAddModList***  Includes the list of WLAN identifiers to be added to the measurement configuration. |
| ***wlan-ToRemoveList***  Includes the list of WLAN identifiers to be removed from the measurement configuration. |

#### – *MeasResults*

The IE *MeasResults* covers measured results for intra-frequency, inter-frequency and inter- RAT mobility and for idle/inactive measurements.

*MeasResults* information element

-- ASN1START

MeasResults ::= SEQUENCE {

measId MeasId,

measResultPCell SEQUENCE {

rsrpResult RSRP-Range,

rsrqResult RSRQ-Range

},

measResultNeighCells CHOICE {

measResultListEUTRA MeasResultListEUTRA,

measResultListUTRA MeasResultListUTRA,

measResultListGERAN MeasResultListGERAN,

measResultsCDMA2000 MeasResultsCDMA2000,

...,

measResultNeighCellListNR-r15 MeasResultCellListNR-r15

} OPTIONAL,

...,

[[ measResultForECID-r9 MeasResultForECID-r9 OPTIONAL

]],

[[ locationInfo-r10 LocationInfo-r10 OPTIONAL,

measResultServFreqList-r10 MeasResultServFreqList-r10 OPTIONAL

]],

[[ measId-v1250 MeasId-v1250 OPTIONAL,

measResultPCell-v1250 RSRQ-Range-v1250 OPTIONAL,

measResultCSI-RS-List-r12 MeasResultCSI-RS-List-r12 OPTIONAL

]],

[[ measResultForRSSI-r13 MeasResultForRSSI-r13 OPTIONAL,

measResultServFreqListExt-r13 MeasResultServFreqListExt-r13 OPTIONAL,

measResultSSTD-r13 MeasResultSSTD-r13 OPTIONAL,

measResultPCell-v1310 SEQUENCE {

rs-sinr-Result-r13 RS-SINR-Range-r13

} OPTIONAL,

ul-PDCP-DelayResultList-r13 UL-PDCP-DelayResultList-r13 OPTIONAL,

measResultListWLAN-r13 MeasResultListWLAN-r13 OPTIONAL

]],

[[ measResultPCell-v1360 RSRP-Range-v1360 OPTIONAL

]],

[[ measResultListCBR-r14 MeasResultListCBR-r14 OPTIONAL,

measResultListWLAN-r14 MeasResultListWLAN-r14 OPTIONAL

]],

[[ measResultServFreqListNR-r15 MeasResultServFreqListNR-r15 OPTIONAL,

measResultCellListSFTD-r15 MeasResultCellListSFTD-r15 OPTIONAL

]],

[[ logMeasResultListBT-r15 LogMeasResultListBT-r15 OPTIONAL,

logMeasResultListWLAN-r15 LogMeasResultListWLAN-r15 OPTIONAL,

measResultSensing-r15 MeasResultSensing-r15 OPTIONAL,

heightUE-r15 INTEGER (-400..8880) OPTIONAL

]],

[[ ul-PDCP-DelayValueResultList-r16 UL-PDCP-DelayValueResultList-r16 OPTIONAL,

measResultForRSSI-NR-r16 MeasResultForRSSI-NR-r16 OPTIONAL

]],

[[ uncomBarPreMeasResult-r17 OCTET STRING OPTIONAL,

coarseLocationInfo-r17 OCTET STRING OPTIONAL

]]

}

MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA

MeasResultEUTRA ::= SEQUENCE {

physCellId PhysCellId,

cgi-Info SEQUENCE {

cellGlobalId CellGlobalIdEUTRA,

trackingAreaCode TrackingAreaCode,

plmn-IdentityList PLMN-IdentityList2 OPTIONAL

} OPTIONAL,

measResult SEQUENCE {

rsrpResult RSRP-Range OPTIONAL,

rsrqResult RSRQ-Range OPTIONAL,

...,

[[ additionalSI-Info-r9 AdditionalSI-Info-r9 OPTIONAL

]],

[[ primaryPLMN-Suitable-r12 ENUMERATED {true} OPTIONAL,

measResult-v1250 RSRQ-Range-v1250 OPTIONAL

]],

[[ rs-sinr-Result-r13 RS-SINR-Range-r13 OPTIONAL,

cgi-Info-v1310 SEQUENCE {

freqBandIndicator-r13 FreqBandIndicator-r11 OPTIONAL,

multiBandInfoList-r13 MultiBandInfoList-r11 OPTIONAL,

freqBandIndicatorPriority-r13 ENUMERATED {true} OPTIONAL

} OPTIONAL

]],

[[

measResult-v1360 RSRP-Range-v1360 OPTIONAL

]],

[[

cgi-Info-5GC-r15 SEQUENCE (SIZE (1..maxPLMN-r11)) OF CellAccessRelatedInfo-5GC-r15 OPTIONAL

]]

}

}

MeasResultListIdle-r15 ::= SEQUENCE (SIZE (1..maxIdleMeasCarriers-r15)) OF MeasResultIdle-r15

MeasResultIdle-r15 ::= SEQUENCE {

measResultServingCell-r15 SEQUENCE {

rsrpResult-r15 RSRP-Range,

rsrqResult-r15 RSRQ-Range-r13

},

measResultNeighCells-r15 CHOICE {

measResultIdleListEUTRA-r15 MeasResultIdleListEUTRA-r15,

...

} OPTIONAL,

...

}

MeasResultIdleListEUTRA-r15 ::= SEQUENCE (SIZE (1..maxCellMeasIdle-r15)) OF MeasResultIdleEUTRA-r15

MeasResultIdleEUTRA-r15 ::= SEQUENCE {

carrierFreq-r15 ARFCN-ValueEUTRA-r9,

physCellId-r15 PhysCellId,

measResult-r15 SEQUENCE {

rsrpResult-r15 RSRP-Range,

rsrqResult-r15 RSRQ-Range-r13

},

...

}

MeasResultListExtIdle-r16 ::= SEQUENCE(SIZE (1..maxIdleMeasCarriersExt-r16)) OF MeasResultIdleListEUTRA-r15

MeasResultListIdleNR-r16 ::= SEQUENCE(SIZE (1..maxIdleMeasCarriers-r16)) OF MeasResultIdleNR-r16

MeasResultIdleNR-r16 ::= SEQUENCE {

carrierFreqNR-r16 ARFCN-ValueNR-r15,

measResultsPerCellListIdleNR-r16 SEQUENCE (SIZE (1..maxCellMeasIdle-r15)) OF MeasResultsPerCellIdleNR-r16,

...

}

MeasResultsPerCellIdleNR-r16 ::= SEQUENCE {

physCellIdNR-r16 PhysCellIdNR-r15,

measIdleResultNR-r16 SEQUENCE {

rsrpResultNR-r16 RSRP-RangeNR-r15 OPTIONAL,

rsrqResultNR-r16 RSRQ-RangeNR-r15 OPTIONAL,

resultRS-IndexList-r16 ResultsPerSSB-IndexList-r16 OPTIONAL

},

...

}

ResultsPerSSB-IndexList-r16 ::= SEQUENCE (SIZE (1..maxRS-IndexReport-r15)) OF ResultsPerSSB-IndexIdle-r16

ResultsPerSSB-IndexIdle-r16 ::= SEQUENCE {

ssb-Index-r16 RS-IndexNR-r15,

ssb-Results-r16 SEQUENCE {

ssb-RSRP-Result-r16 RSRP-RangeNR-r15 OPTIONAL,

ssb-RSRQ-Result-r16 RSRQ-RangeNR-r15 OPTIONAL

} OPTIONAL

}

MeasResultServFreqListNR-r15 ::= SEQUENCE (SIZE (1..maxServCell-r13)) OF MeasResultServFreqNR-r15

MeasResultServFreqNR-r15 ::= SEQUENCE {

carrierFreq-r15 ARFCN-ValueNR-r15,

measResultSCell-r15 MeasResultCellNR-r15 OPTIONAL,

measResultBestNeighCell-r15 MeasResultCellNR-r15 OPTIONAL,

...

}

MeasResultCellListNR-r15::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultCellNR-r15

MeasResultCellNR-r15 ::= SEQUENCE {

pci-r15 PhysCellIdNR-r15,

measResultCell-r15 MeasResultNR-r15,

measResultRS-IndexList-r15 MeasResultSSB-IndexList-r15 OPTIONAL,

...,

[[ cgi-Info-r15 CGI-InfoNR-r15 OPTIONAL

]]

}

MeasResultNR-r15 ::= SEQUENCE {

rsrpResult-r15 RSRP-RangeNR-r15 OPTIONAL,

rsrqResult-r15 RSRQ-RangeNR-r15 OPTIONAL,

rs-sinr-Result-r15 RS-SINR-RangeNR-r15 OPTIONAL,

...

}

MeasResultSSB-IndexList-r15::= SEQUENCE (SIZE (1..maxRS-IndexReport-r15)) OF MeasResultSSB-Index-r15

MeasResultSSB-Index-r15 ::= SEQUENCE {

ssb-Index-r15 RS-IndexNR-r15,

measResultSSB-Index-r15 MeasResultNR-r15 OPTIONAL,

...

}

MeasResultServFreqList-r10 ::= SEQUENCE (SIZE (1..maxServCell-r10)) OF MeasResultServFreq-r10

MeasResultServFreqListExt-r13 ::= SEQUENCE (SIZE (1..maxServCell-r13)) OF MeasResultServFreq-r13

MeasResultServFreq-r10 ::= SEQUENCE {

servFreqId-r10 ServCellIndex-r10,

measResultSCell-r10 SEQUENCE {

rsrpResultSCell-r10 RSRP-Range,

rsrqResultSCell-r10 RSRQ-Range

} OPTIONAL,

measResultBestNeighCell-r10 SEQUENCE {

physCellId-r10 PhysCellId,

rsrpResultNCell-r10 RSRP-Range,

rsrqResultNCell-r10 RSRQ-Range

} OPTIONAL,

...,

[[ measResultSCell-v1250 RSRQ-Range-v1250 OPTIONAL,

measResultBestNeighCell-v1250 RSRQ-Range-v1250 OPTIONAL

]],

[[ measResultSCell-v1310 SEQUENCE {

rs-sinr-Result-r13 RS-SINR-Range-r13

} OPTIONAL,

measResultBestNeighCell-v1310 SEQUENCE {

rs-sinr-Result-r13 RS-SINR-Range-r13

} OPTIONAL

]]

}

MeasResultServFreq-r13 ::= SEQUENCE {

servFreqId-r13 ServCellIndex-r13,

measResultSCell-r13 SEQUENCE {

rsrpResultSCell-r13 RSRP-Range,

rsrqResultSCell-r13 RSRQ-Range-r13,

rs-sinr-Result-r13 RS-SINR-Range-r13 OPTIONAL

} OPTIONAL,

measResultBestNeighCell-r13 SEQUENCE {

physCellId-r13 PhysCellId,

rsrpResultNCell-r13 RSRP-Range,

rsrqResultNCell-r13 RSRQ-Range-r13,

rs-sinr-Result-r13 RS-SINR-Range-r13 OPTIONAL

} OPTIONAL,

...,

[[ measResultBestNeighCell-v1360 SEQUENCE {

rsrpResultNCell-v1360 RSRP-Range-v1360

} OPTIONAL

]]

}

MeasResultCSI-RS-List-r12 ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultCSI-RS-r12

MeasResultCSI-RS-r12 ::= SEQUENCE {

measCSI-RS-Id-r12 MeasCSI-RS-Id-r12,

csi-RSRP-Result-r12 CSI-RSRP-Range-r12,

...

}

MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultUTRA

MeasResultUTRA ::= SEQUENCE {

physCellId CHOICE {

fdd PhysCellIdUTRA-FDD,

tdd PhysCellIdUTRA-TDD

},

cgi-Info SEQUENCE {

cellGlobalId CellGlobalIdUTRA,

locationAreaCode BIT STRING (SIZE (16)) OPTIONAL,

routingAreaCode BIT STRING (SIZE (8)) OPTIONAL,

plmn-IdentityList PLMN-IdentityList2 OPTIONAL

} OPTIONAL,

measResult SEQUENCE {

utra-RSCP INTEGER (-5..91) OPTIONAL,

utra-EcN0 INTEGER (0..49) OPTIONAL,

...,

[[ additionalSI-Info-r9 AdditionalSI-Info-r9 OPTIONAL

]],

[[ primaryPLMN-Suitable-r12 ENUMERATED {true} OPTIONAL

]]

}

}

MeasResultListGERAN ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultGERAN

MeasResultGERAN ::= SEQUENCE {

carrierFreq CarrierFreqGERAN,

physCellId PhysCellIdGERAN,

cgi-Info SEQUENCE {

cellGlobalId CellGlobalIdGERAN,

routingAreaCode BIT STRING (SIZE (8)) OPTIONAL

} OPTIONAL,

measResult SEQUENCE {

rssi INTEGER (0..63),

...

}

}

MeasResultsCDMA2000 ::= SEQUENCE {

preRegistrationStatusHRPD BOOLEAN,

measResultListCDMA2000 MeasResultListCDMA2000

}

MeasResultListCDMA2000 ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultCDMA2000

MeasResultCDMA2000 ::= SEQUENCE {

physCellId PhysCellIdCDMA2000,

cgi-Info CellGlobalIdCDMA2000 OPTIONAL,

measResult SEQUENCE {

pilotPnPhase INTEGER (0..32767) OPTIONAL,

pilotStrength INTEGER (0..63),

...

}

}

MeasResultListWLAN-r13 ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultWLAN-r13

MeasResultListWLAN-r14 ::= SEQUENCE (SIZE (1..maxWLAN-Id-Report-r14)) OF MeasResultWLAN-r13

MeasResultWLAN-r13 ::= SEQUENCE {

wlan-Identifiers-r13 WLAN-Identifiers-r12,

carrierInfoWLAN-r13 WLAN-CarrierInfo-r13 OPTIONAL,

bandWLAN-r13 WLAN-BandIndicator-r13 OPTIONAL,

rssiWLAN-r13 WLAN-RSSI-Range-r13,

availableAdmissionCapacityWLAN-r13 INTEGER (0..31250) OPTIONAL,

backhaulDL-BandwidthWLAN-r13 WLAN-backhaulRate-r12 OPTIONAL,

backhaulUL-BandwidthWLAN-r13 WLAN-backhaulRate-r12 OPTIONAL,

channelUtilizationWLAN-r13 INTEGER (0..255) OPTIONAL,

stationCountWLAN-r13 INTEGER (0..65535) OPTIONAL,

connectedWLAN-r13 ENUMERATED {true} OPTIONAL,

...

}

MeasResultListCBR-r14 ::= SEQUENCE (SIZE (1..maxCBR-Report-r14)) OF MeasResultCBR-r14

MeasResultCBR-r14 ::= SEQUENCE {

poolIdentity-r14 SL-V2X-TxPoolReportIdentity-r14,

cbr-PSSCH-r14 SL-CBR-r14,

cbr-PSCCH-r14 SL-CBR-r14 OPTIONAL

}

MeasResultSensing-r15 ::= SEQUENCE {

sl-SubframeRef-r15 INTEGER (0..10239),

sensingResult-r15 SEQUENCE (SIZE (0..400)) OF SensingResult-r15

}

SensingResult-r15 ::= SEQUENCE {

resourceIndex-r15 INTEGER (1..2000)

}

MeasResultForECID-r9 ::= SEQUENCE {

ue-RxTxTimeDiffResult-r9 INTEGER (0..4095),

currentSFN-r9 BIT STRING (SIZE (10))

}

PLMN-IdentityList2 ::= SEQUENCE (SIZE (1..5)) OF PLMN-Identity

AdditionalSI-Info-r9 ::= SEQUENCE {

csg-MemberStatus-r9 ENUMERATED {member} OPTIONAL,

csg-Identity-r9 CSG-Identity OPTIONAL

}

MeasResultForRSSI-r13 ::= SEQUENCE {

rssi-Result-r13 RSSI-Range-r13,

channelOccupancy-r13 INTEGER (0..100),

...

}

MeasResultForRSSI-NR-r16 ::= SEQUENCE {

rssi-ResultNR-r16 RSSI-Range-r13,

channelOccupancyNR-r16 INTEGER (0..100),

...

}

UL-PDCP-DelayResultList-r13 ::= SEQUENCE (SIZE (1..maxQCI-r13)) OF UL-PDCP-DelayResult-r13

UL-PDCP-DelayResult-r13 ::= SEQUENCE {

qci-Id-r13 ENUMERATED {qci1, qci2, qci3, qci4, spare4, spare3, spare2, spare1},

excessDelay-r13 INTEGER (0..31),

...

}

UL-PDCP-DelayValueResultList-r16 ::= SEQUENCE (SIZE (1..maxDRB)) OF UL-PDCP-DelayValueResult-r16

UL-PDCP-DelayValueResult-r16 ::= SEQUENCE {

drb-Id-r16 DRB-Identity,

averageDelay-r16 INTEGER (0..10000),

...

}

CGI-InfoNR-r15 ::= SEQUENCE {

plmn-IdentityInfoList-r15 PLMN-IdentityInfoListNR-r15 OPTIONAL,

frequencyBandList-r15 MultiFrequencyBandListNR-r15 OPTIONAL,

noSIB1-r15 SEQUENCE {

ssb-SubcarrierOffset-r15 INTEGER (0..15),

pdcch-ConfigSIB1-r15 INTEGER (0..255)

} OPTIONAL,

...

}

CellIdentityNR-r15 ::= BIT STRING (SIZE (36))

PLMN-IdentityListNR-r15 ::= SEQUENCE (SIZE (1.. maxPLMN-NR-r15)) OF PLMN-Identity

PLMN-IdentityInfoListNR-r15 ::= SEQUENCE (SIZE (1..maxPLMN-NR-r15)) OF PLMN-IdentityInfoNR-r15

PLMN-IdentityInfoNR-r15 ::= SEQUENCE {

plmn-IdentityList-r15 PLMN-IdentityListNR-r15,

trackingAreaCode-r15 TrackingAreaCodeNR-r15 OPTIONAL,

ran-AreaCode-r15 RAN-AreaCode-r15 OPTIONAL,

cellIdentity-r15 CellIdentityNR-r15

}

TrackingAreaCodeNR-r15 ::= BIT STRING (SIZE (24))

-- ASN1STOP

| *MeasResults* field descriptions |
| --- |
| ***availableAdmissionCapacityWLAN***  Indicates the available admission capacity of WLAN as defined in IEEE 802.11-2012 [67]. |
| ***averageDelay***  Indicates average delay for the packets during the reporting period, as specified in TS 38.314 [103]. Value 0 corresponds to 0 millisecond, value 1 corresponds to 0.1 millisecond, value 2 corresponds to 0.2 millisecond, and so on. |
| ***backhaulDL-BandwidthWLAN***  Indicates the backhaul available downlink bandwidth of WLAN, equal to Downlink Speed times Downlink Load defined in Wi-Fi Alliance Hotspot 2.0 [76]. |
| ***backhaulUL-BandwidthWLAN***  Indicates the backhaul available uplink bandwidth of WLAN, equal to Uplink Speed times Uplink Load defined in Wi-Fi Alliance Hotspot 2.0 [76]. |
| ***bandWLAN***  Indicates the WLAN band. |
| ***carrierFreq***  Indicates the E-UTRA carrier frequency. Within *MeasResultIdleListEUTRA-r15*, UE only includes measurements with the same carrier frequency. |
| ***carrierFreqNR***  Indicates the NR carrier frequency. |
| ***carrierInfoWLAN***  Indicates the WLAN channel information. |
| ***cbr-PSSCH***  Indicates the CBR measurement results on the PSSCH of the pool indicated by *poolIdentity*. If *adjacencyPSCCH-PSSCH* is set to *TRUE* for the pool indicated by *pooIIdentit*y, this field indicates the CBR measurement of both the PSSCH and PSCCH resources which are measured together. |
| ***cbr-PSCCH***  Indicates the CBR measurement results on the PSCCH of the pool indicated by *poolIdentity.* This field is only included if *adjacencyPSCCH-PSSCH* is set to *FALSE* for the pool indicated by *pooIIdentity*. |
| ***channelOccupancy***  Indicates the percentage of samples when the RSSI was above the configured *channelOccupancyThreshold* for the associated *reportConfig*. |
| ***channelUtilizationWLAN***  Indicates WLAN channel utilization as defined in IEEE 802.11-2012 [67]. |
| ***connectedWLAN***  Indicates whether the UE is connected to the WLAN for which the measurement results are applicable. |
| ***coarseLocationInfo***  Parameter type Ellipsoid-Point defined in TS 37.355 [109]. The first/leftmost bit of the first octet contains the most significant bit. The least significant bits of *degreesLatitude* and *degreesLongitude* are set to 0 to meet the accuracy requirement which corresponds to a granularity of approximately 2 km.  It is up to UE implementation how many LSBs are set to 0 to meet the accuracy requirement. |
| ***csg-MemberStatus***  Indicates whether or not the UE is a member of the CSG of the neighbour cell. |
| ***currentSFN***  Indicates the current system frame number when receiving the UE Rx-Tx time difference measurement results from lower layer. |
| ***drb-Id***  Indicates the identity of DRB for which UL PDCP Packet Delay value is provided, according to TS 38.314 [103]. |
| ***excessDelay***  Indicates excess queueing delay ratio in UL, according to excess delay ratio measurement report mapping table, as defined in TS 36.314 [71], Table 4.2.1.1.1-1. |
| ***heightUE***  Indicates height of the UE in meters relative to the sea level. Value 0 corresponds to sea level (i.e., negative value indicates depth of the UE below sea level). Value -400 corresponds to -400 m, value -399 corresponds to -399 m and so on. |
| ***locationAreaCode***  A fixed length code identifying the location area within a PLMN, as defined in TS 23.003 [27]. |
| ***measId***  Identifies the measurement identity for which the reporting is being performed. If the *measId-v1250* is included, the *measId* (i.e. without a suffix) is ignored by eNB. |
| ***measIdleResultNR***  Idle/inactive measurement results for an NR cell (optionally including beam level measurements). |
| ***measResult***  Measured result of an E‑UTRA cell;  Measured result of a UTRA cell;  Measured result of a GERAN cell or frequency;  Measured result of a CDMA2000 cell;  Measured result of a WLAN;  Measured result of UE Rx–Tx time difference;  Measured result of UE SFN, radio frame and subframe timing difference; or  Measured result of RSSI and channel occupancy. |
| ***measResultCSI-RS-List***  Measured results of the CSI-RS resources in discovery signals measurement. |
| ***measResultListCDMA2000***  List of measured results for the maximum number of reported best cells for a CDMA2000 measurement identity. |
| ***measResultListEUTRA***  List of measured results for the maximum number of reported best cells for an E‑UTRA measurement identity. For UE supporting CE Mode B, when CE mode B is not restricted by upper layers, *measResult-v1360* is reported if the measured RSRP is less than -140 dBm. |
| ***measResultListGERAN***  List of measured results for the maximum number of reported best cells or frequencies for a GERAN measurement identity. |
| ***measResultListIdle***  List of measured results for E-UTRA idle/inactive measurements. |
| ***measResultListIdleNR***  List of measured results for NR idle/inactive measurements. |
| ***measResultListSFTD***  List of measured SFTD results for the reported cells for a NR measurement identity. |
| ***measResultListUTRA***  List of measured results for the maximum number of reported best cells for a UTRA measurement identity. |
| ***measResultListWLAN***  List of measured results for the maximum number of reported best WLAN outside the WLAN mobility set and connected WLAN, if any, for a WLAN measurement identity. |
| ***measResultPCell***  Measured result of the PCell. For BL UEs or UEs in CE, when operating in CE Mode B, *measResultPCell-v1360* is reported if the measured RSRP is less than -140 dBm. If sending of the MeasurementReport message is triggered by a measurement configured by the field *sl-ConfigDedicatedEUTRA* that was received within an NR RRCReconfiguration message (i.e. CBR measurements), *measResultPCell* is not applicable, its contents is invalid and ignored by the network. |
| ***measResultsCDMA2000***  Contains the CDMA2000 HRPD pre-registration status and the list of CDMA2000 measurements. |
| ***measResultServFreqList***  Measured results of the serving frequencies: the measurement result of each SCell, if any, and of the best neighbouring cell on each serving frequency. For UE supporting CE Mode B, when CE mode B is not restricted by upper layers, *measResultBestNeighCell-v1360* is reported if the measured RSRP is less than -140 dBm. |
| ***measResultServingCell***  Measured results of the serving cell (i.e., PCell) from idle/inactive measurements. |
| ***measResultsPerCellListIdleNR***  List of idle/inactive measured results for the maximum number of reported best cells for a given NR carrier. |
| ***noSIB1***  Contains *ssb-SubcarrierOffset* and *pdcch-ConfigSIB1* fields acquired by the UE from MIB of the cell for which report CGI procedure was requested by the network in case SIB1 was not broadcast by the cell. |
| ***pilotPnPhase***  Indicates the arrival time of a CDMA2000 pilot, measured relative to the UE's time reference in units of PN chips, see C.S0005 [25]. This information is used in either SRVCC handover or enhanced 1xRTT CS fallback procedure to CDMA2000 1xRTT. |
| ***pilotStrength***  CDMA2000 Pilot Strength, the ratio of pilot power to total power in the signal bandwidth of a CDMA2000 Forward Channel. See C.S0005 [25] for CDMA2000 1xRTT and C.S0024 [26] for CDMA2000 HRPD. |
| ***poolIdentity***  The identity of the transmission resource pool which is corresponding to the *poolReportId* configured ina resource pool for V2X sidelink communication. |
| ***plmn-IdentityList***  The list of PLMN Identity read from broadcast information when the multiple PLMN Identities are broadcast. |
| ***preRegistrationStatusHRPD***  Set to TRUE if the UE is currently pre-registered with CDMA2000 HRPD. Otherwise set to FALSE. This can be ignored by the eNB for CDMA2000 1xRTT. |
| ***qci-Id***  Indicates QCI value for which *excessDelay* is provided, according to TS 36.314 [71]. |
| ***resourceIndex***  Indicates the available resource candidates within the [T1, T2] window as specified in TS 36.213 [23]. clause 14.1.1.6. Value 1 indicates the resource candidate on the subframe indicated by *sl-SubframeRe*f, from subchannel 0 to *sensingSubchannelNumber*-1. Value 2 indicates the resource candidate on the first subframe following the subframe indicated by *sl-SubframeRef*, from subchannel 0 to *sensingSubchannelNumber*-1 (Value 101 indicates the resource candidate on the subframe indicated by *sl-SubframeRef*, from subchannel 1 to *sensingSubchannelNumber*, if the *numSubchannel* of the resource pool is larger than *sensingSubchannelNumber*) and so on. |
| ***resultRS-IndexList***  Beam level measurement results (indexes and optionally, beam measurements). |
| ***routingAreaCode***  The RAC identity read from broadcast information, as defined in TS 23.003 [27]. |
| ***rsrpResult***  Measured RSRP result of an E‑UTRA cell.  The *rsrpResult* is only reported if configured by the eNB. |
| ***rsrpResultNR***  Measured RSRP result of an NR cell.  The *rsrpResultNR* is only reported if configured by the eNB. |
| ***rsrqResult***  Measured RSRQ result of an E‑UTRA cell.  The *rsrqResult* is only reported if configured by the eNB.  If the measurement is performed in RRC\_CONNECTED and measurements based on RSS is enabled in the cell in *measRSS-DedicatedConfig-r16*, E-UTRAN ignores *rsrqResult*. |
| ***rsrqResultNR***  Measured RSRQ result of an NR cell.  The *rsrqResultNR* is only reported if configured by the eNB. |
| ***rssi***  GERAN Carrier RSSI. RXLEV is mapped to a value between 0 and 63, TS 45.008 [28]. When mapping the RXLEV value to the RSSI bit string, the first/leftmost bit of the bit string contains the most significant bit. |
| ***rssi-Result***  Measured RSSI result in dBm. |
| ***rs-sinr-Result***  Measured RS-SINR result of an E‑UTRA or NR cell. The *rs-sinr-Result* is only reported if configured by the eNB. |
| ***rssiWLAN***  Measured WLAN RSSI result in dBm. |
| ***sl-SubframeRef***  Indicates the subframe corresponding to n+T1 used to obtain the sensing measurement results (see TS 36.213 [23]). Specifically, the value indicates the timing offset with respect to subframe#0 of DFN#0 in milliseconds. |
| ***stationCountWLAN***  Indicates the total number stations currently associated with this WLAN as defined in IEEE 802.11-2012 [67]. |
| ***ue-RxTxTimeDiffResult***  UE Rx-Tx time difference measurement result of the PCell, provided by lower layers. If *ue-RxTxTimeDiffPeriodicalTDD-r13* is set to *TRUE*, the measurement mapping is according to EUTRAN TDD UE Rx-Tx time difference report mapping in TS 36.133 [16] and measurement result includes *NTAoffset*, else the measurement mapping is according to EUTRAN FDD UE Rx-Tx time difference report mapping in TS 36.133 [16]. |
| ***uncomBarPreMeasResult***  This field provides barometric pressure measurements as *Sensor-MeasurementInformation* defined in TS 37.355 [109]. The first/leftmost bit of the first octet contains the most significant bit. |
| ***utra-EcN0***  According to CPICH\_Ec/No in TS 25.133 [29] for FDD. Fourteen spare values. The field is not present for TDD. |
| ***utra-RSCP***  According to CPICH\_RSCP in TS 25.133 [29] for FDD and P-CCPCH\_RSCP in TS 25.123 [30] for TDD. Thirty-one spare values. |
| ***wlan-Identifiers***  Indicates the WLAN parameters used for identification of the WLAN for which the measurement results are applicable. |

#### *– MeasResultCellSFTD*

The IE *MeasResultCellSFTD* consists of SFN and radio frame boundary difference between the PCell and an NR cell as specified in TS 38.215 [89] and TS 38.133 [84].

*MeasResultCellSFTD* information element

-- ASN1START

MeasResultCellListSFTD-r15 ::= SEQUENCE (SIZE (1..maxCellSFTD)) OF MeasResultCellSFTD-r15

MeasResultCellSFTD-r15 ::= SEQUENCE {

physCellId-r15 PhysCellIdNR-r15,

sfn-OffsetResult-r15 INTEGER (0..1023),

frameBoundaryOffsetResult-r15 INTEGER (-30720..30719),

rsrpResult-r15 RSRP-RangeNR-r15 OPTIONAL

}

-- ASN1STOP

| *MeasResultCellSFTD* field descriptions |
| --- |
| ***physCellId***  Indicates the physical layer identity (PCI) of an NR cell. | |
| ***sfn-OffsetResult***  Indicates the SFN difference between the PCell and the NR cell as an integer value according to TS 38.215 [89]. |
| ***frameBoundaryOffsetResult***  Indicates the frame boundary difference between the PCell and the NR cell as an integer value according to TS 38.215 [89]. |
| ***rsrpResult***  Measured RSRP result of an NR cell. |

#### – *MeasResultSCG-FailureMRDC*

The IE *MeasResultSCG-FailureMRDC* is used to provide measurement information concerning E-UTRA measurements upon SCG failure detected by a UE configured with NE-DC.

*MeasResultSCG-FailureMRDC* information element

-- ASN1START

MeasResultSCG-FailureMRDC-r15 ::= SEQUENCE {

measResultFreqListEUTRA-r15 MeasResultList3EUTRA-r15,

...,

[[ locationInfo-r16 LocationInfo-r10 OPTIONAL,

logMeasResultListBT-r16 LogMeasResultListBT-r15 OPTIONAL,

logMeasResultListWLAN-r16 LogMeasResultListWLAN-r15 OPTIONAL

]]

}

MeasResultList3EUTRA-r15 ::= SEQUENCE (SIZE (1..maxFreq)) OF MeasResult3EUTRA-r15

MeasResult3EUTRA-r15 ::= SEQUENCE {

carrierFreq-r15 ARFCN-ValueEUTRA-r9,

measResultServingCell-r15 MeasResultEUTRA OPTIONAL,

measResultNeighCellList-r15 MeasResultListEUTRA OPTIONAL,

...

}

-- ASN1STOP

#### *– MeasResultSSTD*

The IE *MeasResultSSTD* consists of SFN, radio frame and subframe boundary difference between the PCell and the PSCell as specified in TS 36.214 [48] and TS 36.133 [16].

*MeasResultSSTD* information element

-- ASN1START

MeasResultSSTD-r13 ::= SEQUENCE {

sfn-OffsetResult-r13 INTEGER (0..1023),

frameBoundaryOffsetResult-r13 INTEGER (-5..4),

subframeBoundaryOffsetResult-r13 INTEGER (0..127)

}

-- ASN1STOP

| ***MeasResultSSTD* field descriptions** |
| --- |
| ***sfn-OffsetResult***  Indicates the SFN difference between the PCell and the PSCell as an integer value according to TS 36.214 [48]. |
| ***frameBoundaryOffsetResult***  Indicates the frame boundary difference between the PCell and the PSCell as an integer value according to TS 36.214 [48]. |
| ***subframeBoundaryOffsetResult***  Indicates the subframe boundary difference between the PCell and the PSCell as an integer value according to the mapping table in TS 36.133 [16]. |

#### – *MeasScaleFactor*

The IE *MeasScaleFactor* specifies the factor for scaling the measurement performance requirements in TS 36.133 [16].

*MeasScaleFactor* information element

-- ASN1START

MeasScaleFactor-r12 ::= ENUMERATED {sf-EUTRA-cf1, sf-EUTRA-cf2}

-- ASN1STOP

NOTE: If the *reducedMeasPerformance* is not included in any *measObjectEUTRA* or *measObjectUTRA* and the *measScaleFactor* is included in the *measConfig*, E-UTRAN can configure any of the values for the *measScaleFactor* as specified in TS 36.133 [16].

#### – *MeasSensing-Config*

The IE *MeasSensing-Config* specifies the input factors for sensing measurement as specified in TS 36.213 [23].

*MeasSensing-Config* information element

-- ASN1START

MeasSensing-Config-r15 ::= SEQUENCE {

sensingSubchannelNumber-r15 INTEGER (1..20),

sensingPeriodicity-r15 ENUMERATED {ms20, ms50, ms100, ms200,

ms300, ms400, ms500, ms600,

ms700, ms800, ms900, ms1000},

sensingReselectionCounter-r15 INTEGER (5..75),

sensingPriority-r15 INTEGER (1..8)

}

-- ASN1STOP

| *MeasSensing-Config* field descriptions |
| --- |
| ***sensingReselectionCounter***  Indicate the value of SL\_RESOURCE\_RESELECTION\_COUNTER, which is used to derive, as specified in TS 36.213 [23], clause 14.1.1.6. |
| ***sensingSubchannelNumber***  Indicate the number of sub-channels, i.e., parameter, as specified in TS 36.213 [23], clause 14.1.1.6. |
| ***sensingPeriodicity***  Indicate the resource reservation interval, i.e., parameter, as specified in TS 36.213 [23], clause 14.1.1.6. |
| ***sensingPriority***  Indicate the priority, i.e., parameter  as specified in TS 36.213 [23], clause 14.1.1.6. |

#### *– MTC-SSB-NR*

The IE *MTC-SSB-NR* specifies the SS/PBCH block measurement timing configuration (SMTC) applicable for SSB based NR measurements i.e. the time occasions for performing these measurements, see 5.5.2.13.

*MTC-SSB-NR* information elements

-- ASN1START

MTC-SSB-NR-r15 ::= SEQUENCE {

periodicityAndOffset-r15 CHOICE {

sf5-r15 INTEGER (0..4),

sf10-r15 INTEGER (0..9),

sf20-r15 INTEGER (0..19),

sf40-r15 INTEGER (0..39),

sf80-r15 INTEGER (0..79),

sf160-r15 INTEGER (0..159)

},

ssb-Duration-r15 ENUMERATED {sf1, sf2, sf3, sf4, sf5 }

}

MTC-SSB2-LP-NR-r16::= SEQUENCE {

pci-List-r16 SEQUENCE (SIZE (1..maxNrofPCI-PerSMTC-r16)) OF PhysCellIdNR-r15

OPTIONAL, -- Need OR

periodicity-r16 ENUMERATED {sf10, sf20, sf40, sf80, sf160, spare3, spare2, spare1}

}

-- ASN1STOP

| *MTC-SSB-NR* field descriptions |
| --- |
| ***pci-List***  PCIs that are known to follow this SMTC. |

#### – *QuantityConfig*

The IE *QuantityConfig* specifies the measurement quantities and layer 3 filtering coefficients for E-UTRA and inter-RAT measurements.

*QuantityConfig* information element

-- ASN1START

QuantityConfig ::= SEQUENCE {

quantityConfigEUTRA QuantityConfigEUTRA OPTIONAL, -- Need ON

quantityConfigUTRA QuantityConfigUTRA OPTIONAL, -- Need ON

quantityConfigGERAN QuantityConfigGERAN OPTIONAL, -- Need ON

quantityConfigCDMA2000 QuantityConfigCDMA2000 OPTIONAL, -- Need ON

...,

[[ quantityConfigUTRA-v1020 QuantityConfigUTRA-v1020 OPTIONAL -- Need ON

]],

[[ quantityConfigEUTRA-v1250 QuantityConfigEUTRA-v1250 OPTIONAL -- Need ON

]],

[[ quantityConfigEUTRA-v1310 QuantityConfigEUTRA-v1310 OPTIONAL, -- Need ON

quantityConfigWLAN-r13 QuantityConfigWLAN-r13 OPTIONAL -- Need ON

]],

[[ quantityConfigNRList-r15 QuantityConfigNRList-r15 OPTIONAL -- Need ON

]]

}

QuantityConfigEUTRA ::= SEQUENCE {

filterCoefficientRSRP FilterCoefficient DEFAULT fc4,

filterCoefficientRSRQ FilterCoefficient DEFAULT fc4

}

QuantityConfigEUTRA-v1250 ::= SEQUENCE {

filterCoefficientCSI-RSRP-r12 FilterCoefficient OPTIONAL -- Need OR

}

QuantityConfigEUTRA-v1310 ::= SEQUENCE {

filterCoefficientRS-SINR-r13 FilterCoefficient DEFAULT fc4

}

QuantityConfigUTRA ::= SEQUENCE {

measQuantityUTRA-FDD ENUMERATED {cpich-RSCP, cpich-EcN0},

measQuantityUTRA-TDD ENUMERATED {pccpch-RSCP},

filterCoefficient FilterCoefficient DEFAULT fc4

}

QuantityConfigUTRA-v1020 ::= SEQUENCE {

filterCoefficient2-FDD-r10 FilterCoefficient DEFAULT fc4

}

QuantityConfigGERAN ::= SEQUENCE {

measQuantityGERAN ENUMERATED {rssi},

filterCoefficient FilterCoefficient DEFAULT fc2

}

QuantityConfigCDMA2000 ::= SEQUENCE {

measQuantityCDMA2000 ENUMERATED {pilotStrength, pilotPnPhaseAndPilotStrength}

}

QuantityConfigNRList-r15 ::= SEQUENCE (SIZE (1..maxQuantSetsNR-r15)) OF QuantityConfigNR-r15

QuantityConfigNR-r15 ::= SEQUENCE {

measQuantityCellNR-r15 QuantityConfigRS-NR-r15,

measQuantityRS-IndexNR-r15 QuantityConfigRS-NR-r15 OPTIONAL

}

QuantityConfigRS-NR-r15 ::= SEQUENCE {

filterCoeff-RSRP-r15 FilterCoefficient DEFAULT fc4,

filterCoeff-RSRQ-r15 FilterCoefficient DEFAULT fc4,

filterCoefficient-SINR-r13 FilterCoefficient DEFAULT fc4

}

QuantityConfigWLAN-r13 ::= SEQUENCE {

measQuantityWLAN-r13 ENUMERATED {rssiWLAN},

filterCoefficient-r13 FilterCoefficient DEFAULT fc4

}

-- ASN1STOP

| *QuantityConfig* field descriptions |
| --- |
| ***filterCoefficient2-FDD***  Specifies the filtering coefficient used for the UTRAN FDD measurement quantity, which is not included in *measQuantityUTRA-FDD*, when *reportQuantityUTRA-FDD* is present in *ReportConfigInterRAT*. |
| ***filterCoefficientCSI-RSRP***  Specifies the filtering coefficient used for CSI-RSRP. |
| ***filterCoefficientRSRP***  Specifies the filtering coefficient used for RSRP. |
| ***filterCoefficientRSRQ***  Specifies the filtering coefficient used for RSRQ. |
| ***filterCoefficientRS-SINR***  Specifies the filtering coefficient used for RS-SINR. |
| ***measQuantityCDMA2000***  Measurement quantity used for CDMA2000 measurements. *pilotPnPhaseAndPilotStrength* is only applicable for *MeasObjectCDMA2000* of *cdma2000-Type* = *type1XRTT*. |
| ***measQuantityRS-IndexNR***  Specifies L3 filter configurations for measurement results of an NR RS index for a particular RS Type (e.g. SS/PBCH block) and the configurable measurement quantities (e.g. RSRP, RSRQ and SINR). |
| ***measQuantityGERAN***  Measurement quantity used for GERAN measurements. |
| ***measQuantityCellINR***  Specifies L3 filter configurations for measurement results of an NR cell for a particular RS Type (e.g. SS/PBCH block) and the configurable measurement quantities (e.g. RSRP, RSRQ and SINR). |
| ***measQuantityUTRA***  Measurement quantity used for UTRA measurements. |
| ***measQuantityWLAN***  Measurement quantity used for WLAN measurements. |
| ***quantityConfigCDMA2000***  Specifies quantity configurations for CDMA2000 measurements. |
| ***quantityConfigEUTRA***  Specifies filter configurations for E‑UTRA measurements. |
| ***quantityConfigGERAN***  Specifies quantity and filter configurations for GERAN measurements. |
| ***quantityConfigUTRA***  Specifies quantity and filter configurations for UTRA measurements. Field *quantityConfigUTRA-v1020* is applicable only when *reportQuantityUTRA-FDD* is configured. |
| ***quantityConfigWLAN***  Specifies quantity and filter configurations for WLAN measurements. |

#### – *ReportConfigEUTRA*

The IE *ReportConfigEUTRA* specifies criteria for triggering of an E‑UTRA measurement reporting or conditional reconfiguration (i.e. conditional handover) event. The E‑UTRA measurement reporting events concerning CRS are labelled A*N* with *N* equal to 1, 2 and so on.

Event A1: Serving becomes better than absolute threshold;

Event A2: Serving becomes worse than absolute threshold;

Event A3: Neighbour becomes amount of offset better than PCell/ PSCell;

Event A4: Neighbour becomes better than absolute threshold;

Event A5: PCell/ PSCell becomes worse than absolute threshold1 AND Neighbour becomes better than another absolute threshold2;

Event A6: Neighbour becomes amount of offset better than SCell.

The E‑UTRA measurement reporting events concerning CRS for conditional reconfigurations are labelled A*N* with *N* equal to 3 or 5.

CondEvent A3: Conditional reconfiguration candidate becomes amount of offset better than PCell;

CondEvent A5: PCell becomes worse than absolute threshold1 AND conditional reconfiguration candidate becomes better than another absolute threshold2;

The E‑UTRA measurement reporting events concerning CSI-RS are labelled C*N* with *N* equal to 1 and 2.

Event C1: CSI-RS resource becomes better than absolute threshold;

Event C2: CSI-RS resource becomes amount of offset better than reference CSI-RS resource.

The E-UTRA measurement reporting events concerning CBR are labelled VN with N equal to 1 and 2.

Event V1: CBR becomes larger than absolute threshold;

Event V2: CBR becomes smaller than absolute threshold.

The E-UTRA reporting events concerning Aerial UE height are labelled H*N* with *N* equal to 1 and 2.

Event H1: Aerial UE height becomes higher than absolute threshold;

Event H2: Aerial UE height becomes lower than absolute threshold.

*ReportConfigEUTRA* information element

-- ASN1START

ReportConfigEUTRA ::= SEQUENCE {

triggerType CHOICE {

event SEQUENCE {

eventId CHOICE {

eventA1 SEQUENCE {

a1-Threshold ThresholdEUTRA

},

eventA2 SEQUENCE {

a2-Threshold ThresholdEUTRA

},

eventA3 SEQUENCE {

a3-Offset INTEGER (-30..30),

reportOnLeave BOOLEAN

},

eventA4 SEQUENCE {

a4-Threshold ThresholdEUTRA

},

eventA5 SEQUENCE {

a5-Threshold1 ThresholdEUTRA,

a5-Threshold2 ThresholdEUTRA

},

...,

eventA6-r10 SEQUENCE {

a6-Offset-r10 INTEGER (-30..30),

a6-ReportOnLeave-r10 BOOLEAN

},

eventC1-r12 SEQUENCE {

c1-Threshold-r12 ThresholdEUTRA-v1250,

c1-ReportOnLeave-r12 BOOLEAN

},

eventC2-r12 SEQUENCE {

c2-RefCSI-RS-r12 MeasCSI-RS-Id-r12,

c2-Offset-r12 INTEGER (-30..30),

c2-ReportOnLeave-r12 BOOLEAN

},

eventV1-r14 SEQUENCE {

v1-Threshold-r14 SL-CBR-r14

},

eventV2-r14 SEQUENCE {

v2-Threshold-r14 SL-CBR-r14

},

eventH1-r15 SEQUENCE {

h1-ThresholdOffset-r15 INTEGER (0..300),

h1-Hysteresis-r15 INTEGER (1..16)

},

eventH2-r15 SEQUENCE {

h2-ThresholdOffset-r15 INTEGER (0..300),

h2-Hysteresis-r15 INTEGER (1..16)

}

},

hysteresis Hysteresis,

timeToTrigger TimeToTrigger

},

periodical SEQUENCE {

purpose ENUMERATED {

reportStrongestCells, reportCGI}

}

},

triggerQuantity ENUMERATED {rsrp, rsrq},

reportQuantity ENUMERATED {sameAsTriggerQuantity, both},

maxReportCells INTEGER (1..maxCellReport),

reportInterval ReportInterval,

reportAmount ENUMERATED {r1, r2, r4, r8, r16, r32, r64, infinity},

...,

[[ si-RequestForHO-r9 ENUMERATED {setup} OPTIONAL, -- Cond reportCGI

ue-RxTxTimeDiffPeriodical-r9 ENUMERATED {setup} OPTIONAL -- Need OR

]],

[[ includeLocationInfo-r10 ENUMERATED {true} OPTIONAL, -- Need OR

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

]],

[[ alternativeTimeToTrigger-r12 CHOICE {

release NULL,

setup TimeToTrigger

} OPTIONAL, -- Need ON

useT312-r12 BOOLEAN OPTIONAL, -- Need ON

usePSCell-r12 BOOLEAN OPTIONAL, -- Need ON

aN-Threshold1-v1250 RSRQ-RangeConfig-r12 OPTIONAL, -- Need ON

a5-Threshold2-v1250 RSRQ-RangeConfig-r12 OPTIONAL, -- Need ON

reportStrongestCSI-RSs-r12 BOOLEAN OPTIONAL, -- Need ON

reportCRS-Meas-r12 BOOLEAN OPTIONAL, -- Need ON

triggerQuantityCSI-RS-r12 BOOLEAN OPTIONAL -- Need ON

]],

[[ reportSSTD-Meas-r13 BOOLEAN OPTIONAL, -- Need ON

rs-sinr-Config-r13 CHOICE {

release NULL,

setup SEQUENCE {

triggerQuantity-v1310 ENUMERATED {sinr} OPTIONAL, -- Need ON

aN-Threshold1-r13 RS-SINR-Range-r13 OPTIONAL, -- Need ON

a5-Threshold2-r13 RS-SINR-Range-r13 OPTIONAL, -- Need ON

reportQuantity-v1310 ENUMERATED {rsrpANDsinr, rsrqANDsinr, all}

}

} OPTIONAL, -- Need ON

useAllowedCellList-r13 BOOLEAN OPTIONAL, -- Need ON

measRSSI-ReportConfig-r13 MeasRSSI-ReportConfig-r13 OPTIONAL, -- Need ON

includeMultiBandInfo-r13 ENUMERATED {true} OPTIONAL, -- Cond reportCGI

ul-DelayConfig-r13 UL-DelayConfig-r13 OPTIONAL -- Need ON

]],

[[ ue-RxTxTimeDiffPeriodicalTDD-r13 BOOLEAN OPTIONAL -- Need ON

]],

[[

purpose-v1430 ENUMERATED {reportLocation, sidelink, spare2, spare1}

OPTIONAL -- Need ON

]],

[[

maxReportRS-Index-r15 INTEGER (0..maxRS-IndexReport-r15) OPTIONAL -- Need ON

]],

[[ includeBT-Meas-r15 BT-NameListConfig-r15 OPTIONAL, -- Need ON

includeWLAN-Meas-r15 WLAN-NameListConfig-r15 OPTIONAL, -- Need ON

purpose-r15 ENUMERATED {sensing} OPTIONAL, -- Need ON

numberOfTriggeringCells-r15 INTEGER (2..maxCellReport) OPTIONAL, -- Cond a3a4a5

a4-a5-ReportOnLeave-r15 BOOLEAN OPTIONAL -- Cond a4a5

]],

[[ condReconfigurationTriggerEUTRA-r16 CondReconfigurationTriggerEUTRA-r16 OPTIONAL,

-- Need ON

ul-DelayValueConfig-r16 UL-DelayValueConfig-r16 OPTIONAL -- Need ON

]],

[[ includeUncomBarPreMeas-r17 BOOLEAN OPTIONAL, -- Need ON

coarseLocationReq-r17 ENUMERATED {true} OPTIONAL -- Need OR

]]

}

CondReconfigurationTriggerEUTRA-r16 ::= SEQUENCE {

condEventId-r16 CHOICE {

condEventA3-r16 SEQUENCE {

a3-Offset-r16 INTEGER (-30..30),

hysteresis-r16 Hysteresis,

timeToTrigger-r16 TimeToTrigger

},

condEventA5-r16 SEQUENCE {

a5-Threshold1-r16 ThresholdEUTRA,

a5-Threshold2-r16 ThresholdEUTRA,

hysteresis-r16 Hysteresis,

timeToTrigger-r16 TimeToTrigger

},

...

}

}

RSRQ-RangeConfig-r12 ::= CHOICE {

release NULL,

setup RSRQ-Range-v1250

}

ThresholdEUTRA ::= CHOICE{

threshold-RSRP RSRP-Range,

threshold-RSRQ RSRQ-Range

}

ThresholdEUTRA-v1250 ::= CSI-RSRP-Range-r12

MeasRSSI-ReportConfig-r13 ::= SEQUENCE {

channelOccupancyThreshold-r13 RSSI-Range-r13 OPTIONAL -- Need OR

}

-- ASN1STOP

| *ReportConfigEUTRA* field descriptions |
| --- |
| ***a3-Offset/ a6-Offset/ c2-Offset***  Offset value to be used in EUTRA measurement report triggering condition for event a3/ a6/ c2, or to be used in conditional reconfiguration trigger condition for cond event a3. The actual value is field value \* 0.5 dB. |
| ***a5-Threshold1/ a5-Threshold2***  Threshold value associated to the selected trigger quantity (e.g. RSRP, RSRQ, SINR) to be used in conditional reconfiguration trigger condition for cond event a5. In the same *condeventA5*, the network configures the same quantity for the *TriggerQuantity* of the *a5-Threshold1* and for the *MeasTriggerQuantity* of the *a5-Threshold2*. |
| ***alternativeTimeToTrigger***  Indicates the time to trigger applicable for cells specified in *altTTT-CellsToAddModList* of the associated measurement object, if configured |
| ***aN-ThresholdM/ cN-ThresholdM***  Threshold to be used in EUTRA measurement report triggering condition for event number aN/ cN. If multiple thresholds are defined for event number aN/ cN, the thresholds are differentiated by M. E-UTRAN configures *aN-Threshold1* only for events A1, A2, A4, A5 and *a5-Threshold2* only for event A5. |
| ***c1-ReportOnLeave/ c2-ReportOnLeave***  Indicates whether or not the UE shall initiate the measurement reporting procedure when the leaving condition is met for a CSI-RS resource in *csi-RS-TriggeredList*, as specified in 5.5.4.1. |
| ***c2-RefCSI-RS***  Identity of the CSI-RS resource from the *measCSI-RS-ToAddModList* of the associated *measObject*, to be used as the reference CSI-RS resource in EUTRA measurement report triggering condition for event c2. |
| ***channelOccupancyThreshold***  RSSI threshold which is used for channel occupancy evaluation. |
| ***condEventId***  Choice of conditional reconfiguration event triggered criteria. |
| ***condReconfigurationTriggerEUTRA***  Event configured for conditional reconfiguration. If this field is configured, the UE shall ignore the configuration of *triggerType, reportQuantity, maxReportCells, reportInterval,* and *reportAmount.* |
| ***coarseLocationReq***  If this field is set to *true*, the UE shall report coarse loaction information if available. |
| ***eventId***  Choice of E‑UTRA event triggered reporting criteria. EUTRAN may set this field to *eventC1* or *eventC2* only if *measDS-Config* is configured in the associated *measObject* with one or more CSI-RS resources. The *eventC1* and *eventC2* are not applicable for the *eventId* if RS-SINR is configured as *triggerQuantity* or *reportQuantity*. |
| ***h1-Hysteresis, h2-Hysteresis***  This parameter is used within the entry and leave condition of an event triggered reporting condition for event H1 and event H2. The actual value is field value. If this field is configured UE shall ignore parameter *hysteresis.* |
| ***h1-ThresholdOffset, h2-ThresholdOffset***  An offset value to *heightThreshRef* to obtain the threshold to be used in EUTRA height report triggering condition for event H1 and event H2. The value for h1-ThresholdOffset and h2-ThresholdOffset is expressed in meters such that granularity is 2meters. Value 0 corresponds to offset value 0m, value 1 corresponds to offset value 2m, value 2 correspond to offset value 4m, and so on. |
| ***includeMultiBandInfo***  If this field is present, the UE shall acquire and include multi band information in the measurement report. | |
| ***maxReportCells***  Max number of cells, excluding the serving cell, to include in the measurement report concerning CRS, and max number of CSI-RS resources to include in the measurement report concerning CSI-RS. |
| ***measRSSI-ReportConfig***  If this field is present, the UE shall perform measurement reporting for RSSI and channel occupancy and ignore the *triggerQuantity*, *reportQuantity* and *maxReportCells* fields. E-UTRAN sets this field to *true* only when setting *triggerType* to *periodical* and *purpose* to *reportStrongestCells*. |
| ***numberOfTriggeringCells***  Indicates the number of cells detected that are required to fulfill an event for a measurement report to be triggered. This field is set only for the events concerning neighbor cells, i.e. *eventA3*, *eventA4, eventA5*. |
| ***reportAmount***  Number of measurement reports applicable for *triggerType* *event* as well as for *triggerType* *periodical*. In case *purpose* is set to *reportCGI* or *reportSSTD-Meas* is set to *true*, only value 1 applies. |
| ***reportCRS-Meas***  If this field is set to *TRUE* the UE shall include rsrp, rsrq together with csi-rsrp in the measurement report, if possible. |
| ***reportOnLeave/ a6-ReportOnLeave/ a4-a5-ReportOnLeave***  Indicates whether or not the UE shall initiate the measurement reporting procedure when the leaving condition is met for a cell in *cellsTriggeredList*, as specified in 5.5.4.1. |
| ***reportQuantity***  The quantities to be included in the measurement report***.*** The value both means that both the rsrp and rsrq quantities are to be included in the measurement report. The value *rsrpANDsinr* and *rsrqANDsinr* mean that both *rsrp* and *rs-sinr* quantities, and both *rsrq* and *rs-sinr* quantities are to be included respectively in the measurement report. The value *all* means that *rsrp*, *rsrq* and *rs-sinr* are to be included in the measurement report. In case *triggerQuantityCSI-RS* is set to *TRUE*, only value *sameAsTriggerQuantity* applies. If *reportQuantity*-v*1310* is configured, the UE only considers this extension (and ignores *reportQuantity* i.e. without suffix). |
| ***reportSSTD-Meas***  If this field is set to *true*, the UE shall measure SSTD between the PCell and the PSCell as specified in TS 36.214 [48] and ignore the *triggerQuantity*, *reportQuantity* and *maxReportCells* fields. E-UTRAN sets this field to *true* only when setting *triggerType* to *periodical* and *purpose* to *reportStrongestCells*. |
| ***reportStrongestCSI-RSs***  Indicates that periodical CSI-RS measurement report is performed. EUTRAN configures value *TRUE* only if *measDS-Config* is configured in the associated *measObject* with one or more CSI-RS resources. |
| ***si-RequestForHO***  The field applies to the *reportCGI* functionality, and when the field is included, the UE is allowed to use autonomous gaps in acquiring system information from the neighbour cell, applies a different value for T321, and includes different fields in the measurement report. |
| ***ThresholdEUTRA***  For RSRP: RSRP based threshold for event evaluation. The actual value is field value – 140 dBm.  For RSRQ: RSRQ based threshold for event evaluation. The actual value is (field value – 40)/2 dB.  For RS-SINR: RS-SINR based threshold for event evaluation. The actual value is (field value -46)/2 dB.  For CSI-RSRP: CSI-RSRP based threshold for event evaluation. The actual value is field value – 140 dBm.  EUTRAN configures the same threshold quantity for all the thresholds of an event. |
| ***timeToTrigger***  Time during which specific criteria for the event needs to be met in order to trigger a measurement report, or to execute the conditional reconfiguration evaluation. |
| ***triggerQuantity***  The quantity used to evaluate the triggering condition for the event concerning CRS***.*** EUTRAN sets the value according to the quantity of the *ThresholdEUTRA* for this event. The values rsrp, rsrq and *sinr* correspond to Reference Signal Received Power (RSRP), Reference Signal Received Quality (RSRQ) and Reference Signal Signal to Noise and Interference Ratio (RS-SINR), see TS 36.214 [48]. If *triggerQuantity-v1310* is configured, the UE only considers this extension (and ignores *triggerQuantity* i.e. without suffix). |
| ***triggerQuantityCSI-RS***  The quantity used to evaluate the triggering condition for the event concerning CSI-RS***.*** The value *TRUE* corresponds to CSI Reference Signal Received Power (CSI-RSRP), see TS 36.214 [48]. E-UTRAN configures value *TRUE* if and only if the measurement reporting event concerns CSI-RS. |
| ***ue-RxTxTimeDiffPeriodical***  If this field is present, the UE shall perform UE Rx-Tx time difference measurement reporting and ignore the fields *triggerQuantity*, *reportQuantity* and *maxReportCells*. If the field is present, the only applicable values for the corresponding *triggerType* and *purpose* are periodical and reportStrongestCells respectively. |
| ***ue-RxTxTimeDiffPeriodicalTDD***  If this field is set to *TRUE*, the UE shall performUE Rx-Tx time difference measurement reporting according to EUTRAN TDD UE Rx-Tx time difference report mapping in TS 36.133 [16]. If the field is configured, the *ue-RxTxTimeDiffPeriodical* shall be configured. The field is applicable for TDD only. |
| ***useAllowedCellList***  Indicates whether only the cells included in the list of allow-listed cells of the associated *measObject* are applicable as specified in 5.5.4.1. E-UTRAN does not configure the field for events A1, A2, C1 and C2. |
| ***usePSCell***  If this field is set to *TRUE* the UE shall use the PSCell instead of the PCell. E-UTRAN configures value *TRUE* only for events A3 and A5, see 5.5.4.4 and 5.5.4.6. |
| ***useT312***  If value *TRUE* is configured, the UE shall use the timer T312 with the value *t312* as specified in the corresponding *measObject*. If the corresponding *measObject* does not include the timer T312 then the timer T312 is considered as not configured. E-UTRAN configures value *TRUE* only if *triggerType* is set to *event*. |
| ***ul-DelayConfig***  If the field is present, E-UTRAN configures UL PDCP Packet Delay per QCI measurement and the UE shall ignore the fields *triggerQuantity* and *maxReportCells*. The applicable values for the corresponding *triggerType* and *reportInterval* are *periodical* and (one of the) ms1024, ms2048, ms5120 or ms10240respectively.The *reportInterval* indicates the periodicity for performing and reporting of UL PDCP Delay per QCI measurement as specified in TS 36.314 [71]. |
| ***ul-DelayValueConfig***  If the field is present, the UE shall perform the UL PDCP Packet Delay measurement per DRB as specified in TS 38.314 [103] and the UE shall ignore the fields *reportQuantityCell* and *maxReportCells*. The applicable values for the corresponding *reportInterval* are (one of the) { ms120, ms240, ms480, ms640, ms1024, ms2048, ms5120, ms10240, min1, min6, min12, min30, min60}. The *reportInterval* indicates the periodicity for performing and reporting of UL PDCP Packet Delay per DRB measurement as specified in TS 38.314 [103]. | |

| Conditional presence | Explanation |
| --- | --- |
| *reportCGI* | The field is optional, need OR, in case *purpose* is included and set to *reportCGI*; otherwise the field is not present and the UE shall delete any existing value for this field. |
| *a3a4a5* | This field is optional, need OR, in case eventId is set to eventA3 or eventA4 or eventA5; otherwise, this field is not present and the UE shall delete any existing value of this field. |
| *a4a5* | This field is optional, need OR, in case eventId is set to eventA4 or eventA5; otherwise, this field is not present and the UE shall delete any existing value of this field. |

#### – *ReportConfigId*

The IE *ReportConfigId* is used to identify a measurement reporting configuration.

*ReportConfigId* information element

-- ASN1START

ReportConfigId ::= INTEGER (1..maxReportConfigId)

-- ASN1STOP

#### – *ReportConfigInterRAT*

The IE *ReportConfigInterRAT* specifies criteria for triggering of an inter-RAT measurement reporting event or of a CPA or MN initiated inter-SN CPC event. The inter-RAT measurement reporting events for NR, UTRAN, GERAN and CDMA2000 are labelled B*N* with *N* equal to 1, 2 and so on. The inter-RAT measurement reporting events for WLAN are labelled W*N* with *N* equal to 1, 2 and so on.

Event B1: Neighbour becomes better than absolute threshold;

Event B2: PCell becomes worse than absolute threshold1 AND Neighbour becomes better than another absolute threshold2.

Event W1: WLAN becomes better than a threshold;

Event W2: All WLAN inside WLAN mobility set become worse than a threshold1 and a WLAN outside WLAN mobility set becomes better than a threshold2;

Event W3: All WLAN inside WLAN mobility set become worse than a threshold.

CondEvent B1: Conditional reconfiguration candidate becomes better than absolute threshold.

The b1 and b2 event thresholds for CDMA2000 are the CDMA2000 pilot detection thresholds are expressed as an unsigned binary number equal to [-2 x 10 log 10 Ec/Io] in units of 0.5dB, see C.S0005 [25] for details.

*ReportConfigInterRAT* information element

-- ASN1START

ReportConfigInterRAT ::= SEQUENCE {

triggerType CHOICE {

event SEQUENCE {

eventId CHOICE {

eventB1 SEQUENCE {

b1-Threshold CHOICE {

b1-ThresholdUTRA ThresholdUTRA,

b1-ThresholdGERAN ThresholdGERAN,

b1-ThresholdCDMA2000 ThresholdCDMA2000

}

},

eventB2 SEQUENCE {

b2-Threshold1 ThresholdEUTRA,

b2-Threshold2 CHOICE {

b2-Threshold2UTRA ThresholdUTRA,

b2-Threshold2GERAN ThresholdGERAN,

b2-Threshold2CDMA2000 ThresholdCDMA2000

}

},

...,

eventW1-r13 SEQUENCE {

w1-Threshold-r13 WLAN-RSSI-Range-r13

},

eventW2-r13 SEQUENCE {

w2-Threshold1-r13 WLAN-RSSI-Range-r13,

w2-Threshold2-r13 WLAN-RSSI-Range-r13

},

eventW3-r13 SEQUENCE {

w3-Threshold-r13 WLAN-RSSI-Range-r13

},

eventB1-NR-r15 SEQUENCE {

b1-ThresholdNR-r15 ThresholdNR-r15,

reportOnLeave-r15 BOOLEAN

},

eventB2-NR-r15 SEQUENCE {

b2-Threshold1-r15 ThresholdEUTRA,

b2-Threshold2NR-r15 ThresholdNR-r15,

reportOnLeave-r15 BOOLEAN

}

},

hysteresis Hysteresis,

timeToTrigger TimeToTrigger

},

periodical SEQUENCE {

purpose ENUMERATED {

reportStrongestCells,

reportStrongestCellsForSON,

reportCGI}

}

},

maxReportCells INTEGER (1..maxCellReport),

reportInterval ReportInterval,

reportAmount ENUMERATED {r1, r2, r4, r8, r16, r32, r64, infinity},

...,

[[ si-RequestForHO-r9 ENUMERATED {setup} OPTIONAL -- Cond reportCGI

]],

[[ reportQuantityUTRA-FDD-r10 ENUMERATED {both} OPTIONAL -- Need OR

]],

[[ includeLocationInfo-r11 BOOLEAN OPTIONAL -- Need ON

]],

[[ b2-Threshold1-v1250 CHOICE {

release NULL,

setup RSRQ-Range-v1250

} OPTIONAL -- Need ON

]],

[[ reportQuantityWLAN-r13 ReportQuantityWLAN-r13 OPTIONAL -- Need ON

]],

[[ reportAnyWLAN-r14 BOOLEAN OPTIONAL -- Need ON

]],

[[ reportQuantityCellNR-r15 ReportQuantityNR-r15 OPTIONAL, -- Need ON

maxReportRS-Index-r15 INTEGER (0..maxRS-IndexReport-r15) OPTIONAL, -- Need ON

reportQuantityRS-IndexNR-r15 ReportQuantityNR-r15 OPTIONAL, -- Need ON

reportRS-IndexResultsNR BOOLEAN OPTIONAL, -- Need ON

reportSFTD-Meas-r15 ENUMERATED {pSCell, neighborCells } OPTIONAL -- Need ON

]],

[[

useAutonomousGapsNR-r16 ENUMERATED {setup} OPTIONAL, -- Cond reportCGI-NR

measRSSI-ReportConfigNR-r16 MeasRSSI-ReportConfig-r13 OPTIONAL -- Need ON

]],

[[condReconfigurationTriggerNR-r17 CondReconfigurationTriggerNR-r17 OPTIONAL-- Need ON

]]

}

CondReconfigurationTriggerNR-r17 ::= SEQUENCE {

condEventId-r17 CHOICE {

condEventB1-NR-r17 SEQUENCE {

b1-ThresholdNR-r17 ThresholdNR-r15,

hysteresis-r17 Hysteresis,

timeToTrigger-r17 TimeToTrigger

},

...

}

}

ThresholdUTRA ::= CHOICE{

utra-RSCP INTEGER (-5..91),

utra-EcN0 INTEGER (0..49)

}

ThresholdGERAN ::= INTEGER (0..63)

ThresholdCDMA2000 ::= INTEGER (0..63)

ReportQuantityNR-r15::= SEQUENCE {

ss-rsrp BOOLEAN,

ss-rsrq BOOLEAN,

ss-sinr BOOLEAN

}

ReportQuantityWLAN-r13 ::= SEQUENCE {

bandRequestWLAN-r13 ENUMERATED {true} OPTIONAL, -- Need OR

carrierInfoRequestWLAN-r13 ENUMERATED {true} OPTIONAL, -- Need OR

availableAdmissionCapacityRequestWLAN-r13 ENUMERATED {true} OPTIONAL, -- Need OR

backhaulDL-BandwidthRequestWLAN-r13 ENUMERATED {true} OPTIONAL, -- Need OR

backhaulUL-BandwidthRequestWLAN-r13 ENUMERATED {true} OPTIONAL, -- Need OR

channelUtilizationRequestWLAN-r13 ENUMERATED {true} OPTIONAL, -- Need OR

stationCountRequestWLAN-r13 ENUMERATED {true} OPTIONAL, -- Need OR

...

}

-- ASN1STOP

| *ReportConfigInterRAT* field descriptions |
| --- |
| ***availableAdmissionCapacityRequestWLAN***  The value true indicates that the UE shall include, if available, WLAN Available Admission Capacity in measurement reports. |
| ***backhaulDL-BandwidthRequestWLAN***  The value true indicates that the UE shall include, if available, WLAN Backhaul Downlink Bandwidth in measurement reports. |
| ***backhaulUL-BandwidthRequestWLAN***  The value true indicates that the UE shall include, if available, WLAN Backhaul Uplink Bandwidth in measurement reports. |
| ***bandRequestWLAN***  The value true indicates that the UE shall include WLAN band in measurement reports. |
| ***bN-ThresholdM***  Threshold to be used in inter RAT measurement report triggering condition for event number bN. If multiple thresholds are defined for event number bN, the thresholds are differentiated by M. |
| ***carrierInfoRequestWLAN***  The value true indicates that the UE shall include, if available, WLAN Carrier Information in measurement reports. |
| ***channelUtilizationRequest-WLAN***  The value true indicates that the UE shall include, if available, WLAN Channel Utilization in measurement reports. |
| ***condReconfigurationTriggerNR***  The conditional reconfiguration trigger event that is used for CPA or MN initiated inter-SN CPC. |
| ***condEventId***  Choice of conditional reconfiguration event triggered criteria. |
| ***eventId***  Choice of inter-RAT event triggered reporting criteria. |
| ***maxReportCells***  Max number of cells, excluding the serving cell, to include in the measurement report. In case *purpose* is set to *reportStrongestCellsForSON* only value 1 applies. For inter-RAT WLAN, it is the maximum number of WLANs to include in the measurement report. |
| ***maxReportRS-Index***  Max number of RS indices to include in the measurement report. E-UTRAN configures value 0 only if it sets *reportRS-IndexResultsNR* to *FALSE*. |
| ***measRSSI-ReportConfigNR***  If this field is present, the UE shall perform measurement reporting for RSSI and channel occupancy and ignore the *triggerQuantity*, *reportQuantity* and *maxReportCells* fields. E-UTRAN sets this field to *true* only when setting *triggerType* to *periodical* and *purpose* to *reportStrongestCells*. |
| ***Purpose***  *reportStrongestCellsForSON* applies only in case *reportConfig* is linked to a *measObject* set to *measObjectUTRA* or *measObjectCDMA2000*. |
| ***reportAmount***  Number of measurement reports applicable for *triggerType* *event* as well as for *triggerType* *periodical*. In case *purpose* is set to *reportCGI* or reportStrongestCellsForSON only value 1 applies. In case *reportSFTD-Meas* is configured, only value 1 applies. |
| ***reportAnyWLAN***  Indicates UE to report any WLAN AP meeting the triggering requirements, even if it is not included in the corresponding *MeasObjectWLAN*. |
| ***reportOnLeave***  Indicates whether or not the UE shall initiate the measurement reporting procedure when the leaving condition is met for a cell in *cellsTriggeredList*, as specified in 5.5.4.1. |
| ***reportQuantityUTRA-FDD***  The quantities to be included in the UTRA measurement report***.*** The value *both* means that both the cpich RSCP and cpich EcN0 quantities are to be included in the measurement report. |
| ***reportRS-IndexResultsNR***  Indicates whether or not the UE shall report beam measurement result of NR in the measurement report. |
| ***reportSFTD-Meas***  If this field is set to *pSCell*, the UE shall measure SFTD between the PCell and the PSCell as specified in TS 38.215 [89], in this case, the frequency of PSCell is configured in the corresponding *measObjectNR*. If the field is set to *neighborCells*, the UE shall measure SFTD between the PCell and the NR cells included in *cellsForWhichToReportSFTD* (if configured in the corresponding *measObjectNR*) or between the PCell and up to 3 strongest detected NR cells (if *cellsForWhichToReportSFTD* is not configured in the corresponding *measObjectNR*), as specified in TS 38.215 [89]. E-UTRAN only includes this field when setting *triggerType* to *periodical* and *purpose* to *reportStrongestCells*. If included, the UE shall ignore the *maxReportCells* field. |
| ***si-RequestForHO***  The field applies to the *reportCGI* functionality, and when the field is included, the UE is allowed to use autonomous gaps in acquiring system information from the neighbour cell, applies a different value for T321, and includes different fields in the measurement report. EUTRAN does not configure the field if *reportConfig* is linked to a *measObject* set to *measObjectNR*. |
| ***ss-rsrp***  Indicates whether or not the UE shall report SS-RSRP quantity of NR. |
| ***ss-rsrq***  Indicates whether or not the UE shall report SS-RSRQ quantity of NR. |
| ***ss-sinr***  Indicates whether or not the UE shall report SS-SINR quantity of NR. |
| ***stationCountRequestWLAN***  The value true indicates that the UE shall include, if available, WLAN Station Count in measurement reports. |
| ***b1-ThresholdGERAN, b2-Threshold2GERAN***  The actual value is field value – 110 dBm. |
| ***b1-ThresholdUTRA, b2-Threshold2UTRA***  *utra-RSCP* corresponds to CPICH\_RSCP in TS 25.133 [29] for FDD and P-CCPCH\_RSCP in TS 25.123 [30] for TDD. *utra-EcN0* corresponds to CPICH\_Ec/No in TS 25.133 [29] for FDD, and is not applicable for TDD.  For *utra-RSCP*: The actual value is field value – 115 dBm.  For *utra-EcN0*: The actual value is (field value – 49)/2 dB. |
| ***timeToTrigger***  Time during which specific criteria for the event needs to be met in order to trigger a measurement report or to execute the conditional reconfiguration evaluation. |
| ***triggerType***  E-UTRAN does not configure the value *periodical* in case *reportConfig* is linked to a *measObject* set to *measObjectWLAN*. |
| ***useAutonomousGapsNR***  The field applies to the *reportCGI* functionality, and when the field is included, the UE is allowed to use autonomous gaps in acquiring system information from the NR neighbour cell, applies the corresponding value for T321, EUTRAN can configure the field only if *reportConfig* is linked to a *measObject* set to *measObjectNR*. | |

| Conditional presence | Explanation |
| --- | --- |
| *reportCGI* | The field is optional, need OR, in case *purpose* is included and set to *reportCGI*; otherwise the field is not present and the UE shall delete any existing value for this field. |
| *reportCGI-NR* | The field is optional, need OR, in case *purpose* is included and set to *reportCGI,* and *reportConfig* is linked to a *measObject* set to *measObjectNR*, otherwise the field is not present and the UE shall delete any existing value for this field. | |

#### – *ReportConfigToAddModList*

The IE *ReportConfigToAddModList* concerns a list of reporting configurations to add or modify

*ReportConfigToAddModList* information element

-- ASN1START

ReportConfigToAddModList ::= SEQUENCE (SIZE (1..maxReportConfigId)) OF ReportConfigToAddMod

ReportConfigToAddMod ::= SEQUENCE {

reportConfigId ReportConfigId,

reportConfig CHOICE {

reportConfigEUTRA ReportConfigEUTRA,

reportConfigInterRAT ReportConfigInterRAT

}

}

-- ASN1STOP

#### – *ReportInterval*

The *ReportInterval* indicates the interval between periodical reports. The *ReportInterval* is applicable if the UE performs periodical reporting (i.e. when *reportAmount* exceeds 1), for *triggerType* *event* as well as for *triggerType* *periodical*. Value ms120 corresponds with 120 ms, ms240 corresponds with 240 ms and so on, while value min1 corresponds with 1 min, min6 corresponds with 6 min and so on.

*ReportInterval* information element

-- ASN1START

ReportInterval ::= ENUMERATED {

ms120, ms240, ms480, ms640, ms1024, ms2048, ms5120, ms10240,

min1, min6, min12, min30, min60, spare3, spare2, spare1}

-- ASN1STOP

#### – *RS-IndexNR*

The IE *RS-IndexNR* is used to identify an NR Reference Signal.

*RS-IndexNR* information element

-- ASN1START

RS-IndexNR-r15 ::= INTEGER (0.. maxRS-Index-1-r15)

-- ASN1STOP

#### – *RSRP-Range*

The IE *RSRP-Range* specifies the value range used in RSRP measurements and thresholds. Integer value for RSRP measurements according to mapping table in TS 36.133 [16]. A given field using *RSRP-Range-v1360* shall only be signalled if the corresponding original field (using *RSRP-Range* i.e. without suffix) is set to value 0.

*RSRP-Range* information element

-- ASN1START

RSRP-Range ::= INTEGER(0..97)

RSRP-Range-v1360 ::= INTEGER(-17..-1)

RSRP-RangeSL-r12 ::= INTEGER(0..13)

RSRP-RangeSL2-r12 ::= INTEGER(0..7)

RSRP-RangeSL3-r12 ::= INTEGER(0..11)

RSRP-RangeSL4-r13 ::= INTEGER(0..49)

-- ASN1STOP

| *RSRP-Range* field descriptions |
| --- |
| ***RSRP-Range***  For UE supporting CE Mode B, when CE mode B is not restricted by upper layers, *RSRP-Range-v1360* (i.e., with suffix) is reported if the measured RSRP is less than -140 dBm. |
| ***RSRP-RangeSL***  Value 0 corresponds to -infinity, value 1 to -115dBm, value 2 to -110dBm, and so on (i.e. in steps of 5dBm) until value 12, which corresponds to -60dBm, while value 13 corresponds to +infinity. |
| ***RSRP-RangeSL2***  Value 0 corresponds to -infinity, value 1 to -110dBm, value 2 to -100dBm, and so on (i.e. in steps of 10dBm) until value 6, which corresponds to -60dBm, while value 7 corresponds to +infinity. |
| ***RSRP-RangeSL3***  Value 0 corresponds to -110dBm, value 1 to -105dBm, value 2 to -100dBm, and so on (i.e. in steps of 5dBm) until value 10, which corresponds to -60dBm, while value 11 corresponds to +infinity. |
| ***RSRP-RangeSL4***  Indicates the range for SD-RSRP. Value 0 corresponds to -130dBm, value 1 to -128dBm, value 2 to -126dBm, and so on (i.e. in steps of 2dBm) until value 48, which corresponds to -34dBm, while value 49 corresponds to +infinity. |

#### – *RSRP-RangeNR*

The IE *RSRP-RangeNR* specifies the value range used in RSRP measurements and thresholds. For RSRP measurements, integer value is according to mapping table in TS 38.133 [84]. For thresholds, the actual value is (field value – 156) dBm, except for field value 127, in which case the actual value is infinity.

*RSRP-RangeNR* information element

-- ASN1START

RSRP-RangeNR-r15 ::= INTEGER (0..127)

-- ASN1STOP

#### – *RSRQ-Range*

The IE *RSRQ-Range* specifies the value range used in RSRQ measurements and thresholds. Integer value for RSRQ measurements is according to mapping table in TS 36.133 [16]. A given field using *RSRQ-Range-v1250* shall only be signalled if the corresponding original field (using *RSRQ-Range* i.e. without suffix) is set to value 0 or 34. Only a UE indicating support of *extendedRSRQ-LowerRange-r12* or *rsrq-OnAllSymbols-r12* may report *RSRQ-Range-v1250*, and this may be done without explicit configuration from the E-UTRAN. If received, the UE shall use the value indicated by the *RSRQ-Range-v1250* and ignore the value signalled by *RSRQ-Range* (without the suffix). *RSRQ-Range-r13* covers the original range and extended *RSRQ-Range-v1250*. *RSRQ-Range-r13* may be signalled without the corresponding original field and without any requirements for indicated support of *extendedRSRQ-LowerRange-r12* or *rsrq-OnAllSymbols-r12.*

*RSRQ-Range* information element

-- ASN1START

RSRQ-Range ::= INTEGER(0..34)

RSRQ-Range-v1250 ::= INTEGER(-30..46)

RSRQ-Range-r13 ::= INTEGER(-30..46)

-- ASN1STOP

#### – *RSRQ-RangeNR*

The IE *RSRQ-RangeNR* specifies the value range used in RSRQ measurements and thresholds. For RSRQ measurements, integer value is according to mapping table in TS 38.133 [84]. For thresholds, the actual value is (field value – 87) / 2 dB.

*RSRQ-RangeNR* information element

-- ASN1START

RSRQ-RangeNR-r15 ::= INTEGER (0..127)

-- ASN1STOP

#### – *RSRQ-Type*

The IE *RSRQ-Type* specifies the RSRQ value type used in RSRQ measurements, see TS 36.214 [48].

*RSRQ-Type* information element

-- ASN1START

RSRQ-Type-r12 ::= SEQUENCE {

allSymbols-r12 BOOLEAN,

wideBand-r12 BOOLEAN

}

-- ASN1STOP

| *RSRQ-Type* field descriptions |
| --- |
| ***allSymbols***  Value TRUE indicates use of all OFDM symbols when performing RSRQ measurements. |
| ***wideBand***  Value TRUE indicates use of a wider bandwidth when performing RSRQ measurements. |

#### – *RS-SINR-Range*

The IE *RS-SINR-Range* specifies the value range used in RS-SINR measurements and thresholds. Integer value for RS-SINR measurements is according to mapping table in TS 36.133 [16].

*RS-SINR-Range* information element

-- ASN1START

RS-SINR-Range-r13 ::= INTEGER(0..127)

-- ASN1STOP

#### – *RS-SINR-RangeNR*

The IE *RS-SINR-RangeNR* specifies the value range used in RS-SINR measurements and thresholds. For RS-SINR measurements, integer value is according to mapping table in TS 38.133 [84]. For thresholds, the actual value is (field value – 46) / 2 dB.

*RS-SINR-RangeNR* information element

-- ASN1START

RS-SINR-RangeNR-r15 ::= INTEGER (0..127)

-- ASN1STOP

#### – *RSSI-Range-r13*

The IE *RSSI-Range* specifies the value range used in RSSI measurements and thresholds. Integer value for RSSI measurements is according to mapping table in TS 36.133 [16].

*RSSI-Range* information element

-- ASN1START

RSSI-Range-r13 ::= INTEGER(0..76)

-- ASN1STOP

#### – *SS-RSSI-Measurement*

The IE *SS-RSSI-Measurement* specifies the configuration of NR SSB based RSSI measurements.

*SS-RSSI-Measurement* information element

-- ASN1START

SS-RSSI-Measurement-r15 ::= SEQUENCE {

measurementSlots-r15 BIT STRING (SIZE(1..80)),

endSymbol-r15 INTEGER(0..3)

}

-- ASN1STOP

| *SS-RSSI-Measurement* field descriptions |
| --- |
| ***endSymbol***  Within a slot that is configured for RSSI measurements (see measurementSlots) the UE measures the RSSI from symbol 0 to symbol endSymbol. This field identifies the entry in Table 5.1.33-1 in TS 36.214 which determines the actual end symbol. |
| ***measurementSlots***  Indicates the slots in which the UE can perform NR RSSI measurements. The length of the BIT STRING is equal to the number of slots in the configured SMTC window (determined by the ssb-duration and by the subcarrierSpacingSSB). The first (left-most / most significant) bit in the bitmap corresponds to the first slot in the SMTC window, the second bit in the bitmap corresponds to the second slot in the SMTC window, and so on. The UE measures in slots for which the corresponding bit in the bitmap is set to 1. |

#### – *SSB-PositionQCL-RelationNR*

The IE *SSB-PositionQCL-RelationNR* is used to indicate the QCL relationship between SSB positions on the indicated frequency or cell (see TS 38.213 [88], clause 4.1) for NR operation with shared spectrum channel access. Value n1 corresponds to 1, value n2 corresponds to 2 and so on.

*SSB-PositionQCL-RelationNR* information element

-- ASN1START

SSB-PositionQCL-RelationNR-r16 ::= ENUMERATED {n1, n2, n4, n8}

-- ASN1STOP

#### – *SSB-ToMeasure*

The IE *SSB-ToMeasure* is used to configure a pattern of SSBs. For operation with shared spectrum channel access, only *mediumBitmap* is used.

*SSB-ToMeasure* information element

-- ASN1START

SSB-ToMeasure-r15 ::= CHOICE {

shortBitmap-r15 BIT STRING (SIZE (4)),

mediumBitmap-r15 BIT STRING (SIZE (8)),

longBitmap-r15 BIT STRING (SIZE (64))

}

-- ASN1STOP

|  |
| --- |
| *SSB-ToMeasure field descriptions* |
| ***longBitmap***  Bitmap when maximum number of SS/PBCH blocks per half frame equals to 64 as defined in TS 38.213 [88], clause 4.1. |
| ***mediumBitmap***  Bitmap when maximum number of SS/PBCH blocks per half frame equals to 8 as defined in TS 38.213 [88], clause 4.1. For operation with shared spectrum channel access, if the k-th bit is set to 1, the UE assumes that one or more SS/PBCH blocks within the SMTC measurement duration with candidate SS/PBCH block indexes corresponding to SS/PBCH block index equal to k - 1 may be transmitted; if the k-th bit is set to 0, the UE assumes that the corresponding SS/PBCH block(s) are not transmitted. The k-th bit is set to 0, where k > *ssb-PositionQCL-CommonNR* and the number of actually transmitted SS/PBCH blocks is not larger than the number of 1's in the bitmap. If *ssb-PositionQCL-NR* is configured with a value smaller than *ssb-PositionQCL-CommonNR*, only the leftmost K bits (K = *ssb-PositionQCL-NR*) are applicable for the corresponding cell. |
| ***shortBitmap***  Bitmap when maximum number of SS/PBCH blocks per half frame equals to 4 as defined in TS 38.213 [88], clause 4.1. |

#### – *TimeToTrigger*

The IE *TimeToTrigger* specifies the value range used for time to trigger parameter, which concerns the time during which specific criteria for the event needs to be met in order to trigger a measurement report. Value ms0 corresponds to 0 ms and behaviour as specified in 7.3.2 applies, ms40 corresponds to 40 ms, and so on.

*TimeToTrigger* information element

-- ASN1START

TimeToTrigger ::= ENUMERATED {

ms0, ms40, ms64, ms80, ms100, ms128, ms160, ms256,

ms320, ms480, ms512, ms640, ms1024, ms1280, ms2560,

ms5120}

-- ASN1STOP

#### – *UL-DelayConfig*

The IE *UL-DelayConfig* IE specifies the configuration of the UL PDCP Packet Delay per QCI measurement specified in TS 36.314 [71].

*UL-DelayConfig* information element

-- ASN1START

UL-DelayConfig-r13 ::= CHOICE {

release NULL,

setup SEQUENCE {

delayThreshold-r13 ENUMERATED {

ms30, ms40, ms50, ms60, ms70, ms80,

ms90,ms100, ms150, ms300, ms500, ms750, spare4,

spare3, spare2, spare1}

}

}

-- ASN1STOP

| *UL-DelayConfig* field descriptions |
| --- |
| ***delayThreshold***  Indicates the delay threshold value used by UE to provide results of UL PDCP Packet Delay per QCI measurement as specified in TS 36.314 [71]. Value in milliseconds. Value ms30 means 30 ms and so on. |

#### – *UL-DelayValueConfig*

The IE *UL-DelayValueConfig* specifies the configuration of the UL PDCP Packet Delay value per DRB measurements specified in TS 38.314 [103].

*UL-DelayValueConfig* information element

-- ASN1START

UL-DelayValueConfig-r16 ::= CHOICE {

release NULL,

setup SEQUENCE {

delay-DRBlist-r16 SEQUENCE (SIZE(1..maxDRB)) OF DRB-Identity

}

}

-- ASN1STOP

| *UL-DelayValueConfig* field descriptions |
| --- |
| ***delay-DRBlist***  Indicates the DRB IDs used by UE to provide results of UL PDCP Packet Delay value per DRB measurement as specified in TS 38.314 [103]. |

#### – *WLAN-CarrierInfo*

The IE *WLAN-CarrierInfo* is used to identify the WLAN frequency band information, as specified in Annex E in [67].

*WLAN-CarrierInfo* information element

-- ASN1START

WLAN-CarrierInfo-r13 ::= SEQUENCE {

operatingClass-r13 INTEGER (0..255) OPTIONAL, -- Need ON

countryCode-r13 ENUMERATED {unitedStates, europe, japan, global, ...}

OPTIONAL, -- Need ON

channelNumbers-r13 WLAN-ChannelList-r13 OPTIONAL, -- Need ON

...

}

WLAN-ChannelList-r13 ::= SEQUENCE (SIZE (1..maxWLAN-Channels-r13)) OF WLAN-Channel-r13

WLAN-Channel-r13 ::= INTEGER(0..255)

-- ASN1STOP

| *WLAN-CarrierInfo* field descriptions |
| --- |
| ***channelNumbers***  Indicates the WLAN channels as defined in IEEE 802.11-2012 [67]. Value 0 is not used. |
| ***countryCode***  Indicates the country code of WLAN as defined in IEEE 802.11-2012 [67]. |
| ***operatingClass***  Indicates the Operating Class of WLAN as defined in IEEE 802.11-2012 [67]. |

#### – *WLAN-NameList*

The IE *WLAN-NameList* is used to indicate the names of the WLAN AP for which the UE is configured to measure.

*WLAN-NameList* information element

-- ASN1START

WLAN-NameListConfig-r15 ::= CHOICE{

release NULL,

setup WLAN-NameList-r15

}

WLAN-NameList-r15 ::= SEQUENCE (SIZE (1..maxWLAN-Name-r15)) OF WLAN-Name-r15

WLAN-Name-r15 ::= OCTET STRING (SIZE (1..32))

-- ASN1STOP

| *WLAN-NameList* field descriptions |
| --- |
| ***WLAN-Name***  If configured, the UE only performs WLAN measurements according to the names identified. For each name, it refers to Service Set Identifier (SSID) defined in IEEE 802.11-2012 [67]. |

#### – *WLAN-RSSI-Range*

The IE *WLAN-RSSI-Range* specifies the value range used in WLAN RSSI measurements and thresholds. Integer value for WLAN RSSI measurements is according to mapping table in TS 36.133 [16]. Value 0 corresponds to -infinity, value 1 to -100dBm, value 2 to -99dBm, and so on (i.e. in steps of 1dBm) until value 140, which corresponds to 39dBm, while value 141 corresponds to +infinity.

*WLAN-RSSI-Range* information element

-- ASN1START

WLAN-RSSI-Range-r13 ::= INTEGER(0..141)

-- ASN1STOP

#### – *WLAN-RTT*

The IE *WLAN-RTT* covers the measured round trip time between the target device and WLAN AP and optionally the accuracy expressed as the standard deviation of the delay.

*WLAN-RTT* information element

-- ASN1START

WLAN-RTT-r15 ::= SEQUENCE {

rttValue-r15 INTEGER (0..16777215),

rttUnits-r15 ENUMERATED { microseconds,

hundredsofnanoseconds,

tensofnanoseconds,

nanoseconds,

tenthsofnanoseconds,

... },

rttAccuracy-r15 INTEGER (0..255) OPTIONAL,

...

}

-- ASN1STOP

| *WLAN-RTT* field descriptions |
| --- |
| ***rttValue***  This field specifies the Round Trip Time (RTT) measurement between the target device and WLAN AP in units given by the field rttUnits as defined in TS 36.355 [54]. |
| ***rttUnits***  This field specifies the Units for the fields rttValue and rttAccuracy. The available Units are 1000ns, 100ns, 10ns, 1ns, and 0.1ns as defined in TS 36.355 [54]. |
| ***rttAccuracy***  This field provides the estimated accuracy of the provided rttValue expressed as the standard deviation in units given by the field rttUnits as defined in TS 36.355 [54]. |

#### – *WLAN-Status*

The IE *WLAN-Status* indicates the current status of WLAN connection. The values are set as described in clause 5.6.15.2 and 5.6.15.4.

*WLAN-Status* information element

-- ASN1START

WLAN-Status-r13 ::= ENUMERATED {successfulAssociation, failureWlanRadioLink, failureWlanUnavailable, failureTimeout}

WLAN-Status-v1430 ::= ENUMERATED {suspended, resumed}

-- ASN1STOP

#### *– WLAN-SuspendConfig*

The IE *WLAN-SuspendConfig* is used for configuration of WLAN suspend/resume functionality.

-- ASN1START

WLAN-SuspendConfig-r14 ::= SEQUENCE {

wlan-SuspendResumeAllowed-r14 BOOLEAN OPTIONAL, -- Need ON

wlan-SuspendTriggersStatusReport-r14 BOOLEAN OPTIONAL -- Need ON

}

-- ASN1STOP

| *WLAN-SuspendConfig* field descriptions |
| --- |
| ***wlan-SuspendResumeAllowed***  Indicates whether the UE is allowed to use suspend-resume mechanism, i.e., to indicate WLAN being temporarily unavailable and WLAN being available again after temporary unavailability. |
| ***wlan-SuspendTriggersStatusReport***  Indicates whether the UE shall trigger PDCP status report as defined in TS 36.323 [8] when WLAN is temporarily unavailable and UE reports this status. |

### 6.3.6 Other information elements

#### – *AbsoluteTimeInfo*

The IE *AbsoluteTimeInfo* indicates an absolute time in a format YY-MM-DD HH:MM:SS and using BCD encoding. The first/ leftmost bit of the bit string contains the most significant bit of the most significant digit of the year and so on.

*AbsoluteTimeInfo* information element

-- ASN1START

AbsoluteTimeInfo-r10 ::= BIT STRING (SIZE (48))

-- ASN1STOP

#### – *AMF-Identifier*

The IE *AMF-Identifier* (AMFI) comprises of an AMF Region ID, an AMF Set ID and an AMF Pointer as specified in 23.003 [27], clause 2.10.1.

*AMF-Identifier* information element

-- ASN1START

AMF-Identifier-r15 ::= BIT STRING (SIZE (24))

-- ASN1STOP

#### – *AreaConfiguration*

The *AreaConfiguration* indicates area for which UE is requested to perform measurement logging. If not configured, measurement logging is not restricted to specific cells or tracking areas but applies as long as the RPLMN is contained in *plmn-IdentityList* stored in *VarLogMeasReport*.

*AreaConfiguration* information element

-- ASN1START

AreaConfiguration-r10 ::= CHOICE {

cellGlobalIdList-r10 CellGlobalIdList-r10,

trackingAreaCodeList-r10 TrackingAreaCodeList-r10

}

AreaConfiguration-v1130 ::= SEQUENCE {

trackingAreaCodeList-v1130 TrackingAreaCodeList-v1130

}

CellGlobalIdList-r10 ::= SEQUENCE (SIZE (1..32)) OF CellGlobalIdEUTRA

TrackingAreaCodeList-r10 ::= SEQUENCE (SIZE (1..8)) OF TrackingAreaCode

TrackingAreaCodeList-v1130 ::= SEQUENCE {

plmn-Identity-perTAC-List-r11 SEQUENCE (SIZE (1..8)) OF PLMN-Identity

}

-- ASN1STOP

| *AreaConfiguration* field descriptions |
| --- |
| ***plmn-Identity-perTAC-List***  Includes the PLMN identity for each of the TA codes included in *trackingAreaCodeList*. The PLMN identity listed first in *plmn-Identity-perTAC-List* corresponds with the TA code listed first in *trackingAreaCodeList* and so on. |

#### *– BandCombinationList*

The IE *BandCombinationList* contains a list of CA band combinations.

***BandCombinationList* information element**

-- ASN1START

BandCombinationList-r14 ::= SEQUENCE (SIZE (1..maxBandComb-r13)) OF BandCombination-r14

BandCombination-r14 ::= SEQUENCE (SIZE (1..maxSimultaneousBands-r10)) OF BandIndication-r14

BandIndication-r14 ::= SEQUENCE {

bandEUTRA-r14 FreqBandIndicator-r11,

ca-BandwidthClassDL-r14 CA-BandwidthClass-r10,

ca-BandwidthClassUL-r14 CA-BandwidthClass-r10 OPTIONAL

}

-- ASN1STOP

#### – *C-RNTI*

The IE *C-RNTI* identifies a UE having a RRC connection within a cell.

*C-RNTI* information element

-- ASN1START

C-RNTI ::= BIT STRING (SIZE (16))

-- ASN1STOP

#### – *DedicatedInfoCDMA2000*

The *DedicatedInfoCDMA200*0 is used to transfer UE specific CDMA2000 information between the network and the UE. The RRC layer is transparent for this information.

*DedicatedInfoCDMA2000* information element

-- ASN1START

DedicatedInfoCDMA2000 ::= OCTET STRING

-- ASN1STOP

#### – *DedicatedInfoF1c*

The IE *DedicatedInfoF1c* is used to transfer IAB-DU specific F1-C related information between the network and the IAB-node. The carried information consists of F1AP message encapsulated in SCTP/IP or F1-C related IP packet with or without SCTP encapsulation, see TS 38.472 [105] and TS 36.423 [108]. The RRC layer is transparent for this information.

*DedicatedInfoF1c* information element

-- ASN1START

DedicatedInfoF1c-r16 ::= OCTET STRING

-- ASN1STOP

#### – *DedicatedInfoNAS*

The IE *DedicatedInfoNAS* is used to transfer UE specific NAS layer information between the network and the UE. The RRC layer is transparent for this information.

*DedicatedInfoNAS* information element

-- ASN1START

DedicatedInfoNAS ::= OCTET STRING

-- ASN1STOP

#### – *FilterCoefficient*

The IE *FilterCoefficient* specifies the measurement filtering coefficient. Value *fc0* corresponds to k = 0, *fc1* corresponds to k = 1, and so on.

*FilterCoefficient* information element

-- ASN1START

FilterCoefficient ::= ENUMERATED {

fc0, fc1, fc2, fc3, fc4, fc5,

fc6, fc7, fc8, fc9, fc11, fc13,

fc15, fc17, fc19, spare1, ...}

-- ASN1STOP

#### – *FlightPathInfoReportConfig*

The IE *FlightPathInfoReportConfig* specifies flight path information report configuration.

*FlightPathInfoReportConfig* information element

-- ASN1START

FlightPathInfoReportConfig-r15 ::= SEQUENCE {

maxWayPointNumber-r15 INTEGER (1..maxWayPoint-r15),

includeTimeStamp-r15 ENUMERATED {true} OPTIONAL

}

-- ASN1STOP

| *FlightPathInfoReportConfig* field descriptions |
| --- |
| ***maxWayPointNumber***  Indicates the maximum number of way points UE can include in the flight path information report if this information is available at the UE. |
| ***includeTimeStamp***  Indicates whether time stamp of each way point can be reported in the flight path information report if time stamp information is available at the UE. |

#### – *GNSS-ID*

The IE *GNSS-ID* is used to indicate a specific GNSS (see also TS 36.355 [54]).

*GNSS-ID* information element

-- ASN1START

GNSS-ID-r15 ::= SEQUENCE {

gnss-id-r15 ENUMERATED{gps, sbas, qzss, galileo, glonass, bds, ..., navic-v1610},

...

}

-- ASN1STOP

#### *– GNSS-ValidityDuration*

The IE *GNSS-ValidityDuration* indicates the remaining GNSS validity duration in the UE. Value s10 corresponds to 10 seconds, s20 corresponds to 20 seconds and so on. Value min5 corresponds to 5 minutes, value min10 corresponds to 10 minutes and so on.

***GNSS-ValidityDuration* information element**

-- ASN1START

GNSS-ValidityDuration-r17 ::= ENUMERATED{

s10, s20, s30, s40, s50, s60, min5, min10,

min15, min20, min25, min30, min50, min90, min120, infinity}

-- ASN1STOP

#### – *I-RNTI*

The *I-RNTI* IE is used to identify the suspended UE context of a UE in RRC\_INACTIVE and for User plane CIoT 5GS optimisation.

*I-RNTI* information element

-- ASN1START

I-RNTI-r15 ::= BIT STRING (SIZE(40))

-- ASN1STOP

#### – *LoggingDuration*

The *LoggingDuration* indicates the duration for which UE is requested to perform measurement logging. Value min10 corresponds to 10 minutes, value min20 corresponds to 20 minutes and so on.

*LoggingDuration* information element

-- ASN1START

LoggingDuration-r10 ::= ENUMERATED {

min10, min20, min40, min60, min90, min120, spare2, spare1}

-- ASN1STOP

#### – *LoggingInterval*

The *LoggingInterval* indicates the periodicity for logging measurement results. Value ms1280 corresponds to 1.28s, value ms2560 corresponds to 2.56s and so on.

*LoggingInterval* information element

-- ASN1START

LoggingInterval-r10 ::= ENUMERATED {

ms1280, ms2560, ms5120, ms10240, ms20480,

ms30720, ms40960, ms61440}

-- ASN1STOP

#### – *MeasSubframePattern*

The IE *MeasSubframePattern* is used to specify a subframe pattern. The first/leftmost bit corresponds to the subframe #0 of the radio frame satisfying SFN mod x = 0, where SFN is that of PCell and x is the size of the bit string divided by 10. "1" denotes that the corresponding subframe is used.

*MeasSubframePattern* information element

-- ASN1START

MeasSubframePattern-r10 ::= CHOICE {

subframePatternFDD-r10 BIT STRING (SIZE (40)),

subframePatternTDD-r10 CHOICE {

subframeConfig1-5-r10 BIT STRING (SIZE (20)),

subframeConfig0-r10 BIT STRING (SIZE (70)),

subframeConfig6-r10 BIT STRING (SIZE (60)),

...

},

...

}

-- ASN1STOP

#### – *MMEC*

The IE *MMEC* identifies an MME within the scope of an MME Group within a PLMN, see TS 23.003 [27].

*MMEC* information element

-- ASN1START

MMEC ::= BIT STRING (SIZE (8))

-- ASN1STOP

#### – *NeighCellConfig*

The IE *NeighCellConfig* is used to provide the information related to MBSFN and TDD UL/DL configuration of neighbour cells.

*NeighCellConfig* information element

-- ASN1START

NeighCellConfig ::= BIT STRING (SIZE (2))

-- ASN1STOP

| *NeighCellConfig* field descriptions |
| --- |
| ***neighCellConfig***  Provides information related to MBSFN and TDD UL/DL configuration of neighbour cells of this frequency  00: Not all neighbour cells have the same MBSFN subframe allocation as the serving cell on this frequency, if configured, and as the PCell otherwise  10: The MBSFN subframe allocations of all neighbour cells are identical to or subsets of that in the serving cell on this frequency, if configured, and of that in the PCell otherwise  01: No MBSFN subframes are present in all neighbour cells  11: Different UL/DL allocation in neighbouring cells for TDD compared to the serving cell on this frequency, if configured, and compared to the PCell otherwise  For TDD, 00, 10 and 01 are only used for same UL/DL allocation in neighbouring cells compared to the serving cell on this frequency, if configured, and compared to the PCell otherwise. |

#### – *NG-5G-S-TMSI*

The IE *NG-5G-S-TMSI* contains a 5G S-Temporary Mobile Subscriber Identity, a temporary UE identity provided by the AMF which uniquely identifies the UE within the tracking area, see TS 23.003 [27].

*NG-5G-S-TMSI* information element

-- ASN1START

NG-5G-S-TMSI-r15::= BIT STRING (SIZE (48))

-- ASN1STOP

#### – *OtherConfig*

The IE *OtherConfig* contains configuration related to other configuration.

*OtherConfig* information element

-- ASN1START

OtherConfig-r9 ::= SEQUENCE {

reportProximityConfig-r9 ReportProximityConfig-r9 OPTIONAL, -- Need ON

...,

[[ idc-Config-r11 IDC-Config-r11 OPTIONAL, -- Need ON

powerPrefIndicationConfig-r11 PowerPrefIndicationConfig-r11 OPTIONAL, -- Need ON

obtainLocationConfig-r11 ObtainLocationConfig-r11 OPTIONAL -- Need ON

]],

[[ bw-PreferenceIndicationTimer-r14 ENUMERATED {s0, s0dot5, s1, s2, s5, s10, s20,

s30, s60, s90, s120, s300, s600, spare3,

spare2, spare1} OPTIONAL, -- Need OR

sps-AssistanceInfoReport-r14 BOOLEAN OPTIONAL, -- Need ON

delayBudgetReportingConfig-r14 CHOICE{

release NULL,

setup SEQUENCE{

delayBudgetReportingProhibitTimer-r14 ENUMERATED {

s0, s0dot4, s0dot8,

s1dot6, s3, s6, s12, s30}

}

} OPTIONAL, -- Need ON

rlm-ReportConfig-r14 CHOICE {

release NULL,

setup SEQUENCE{

rlmReportTimer-r14 ENUMERATED {s0, s0dot5, s1, s2, s5, s10, s20, s30,

s60, s90, s120, s300, s600, spare3, spare2, spare1},

rlmReportRep-MPDCCH-r14 ENUMERATED {setup} OPTIONAL -- Need OR

}

} OPTIONAL -- Need ON

]],

[[ overheatingAssistanceConfig-r14 CHOICE{

release NULL,

setup SEQUENCE{

overheatingIndicationProhibitTimer-r14 ENUMERATED {s0, s0dot5, s1, s2, s5, s10,

s20, s30, s60, s90, s120, s300, s600,

spare3, spare2, spare1}

}

} OPTIONAL -- Need ON

]],

[[ measConfigAppLayer-r15 CHOICE{

release NULL,

setup SEQUENCE{

measConfigAppLayerContainer-r15 OCTET STRING (SIZE(1..1000)),

serviceType-r15 ENUMERATED {qoe, qoemtsi, spare6, spare5, spare4, spare3, spare2, spare1}

}

} OPTIONAL, -- Need ON

ailc-BitConfig-r15 BOOLEAN OPTIONAL, -- Need ON

bt-NameListConfig-r15 BT-NameListConfig-r15 OPTIONAL, --Need ON

wlan-NameListConfig-r15 WLAN-NameListConfig-r15 OPTIONAL --Need ON

]],

[[ overheatingAssistanceConfigForSCG-r16 BOOLEAN OPTIONAL -- Cond overheating

]],

[[ measUncomBarPre-r17 BOOLEAN OPTIONAL, --Need ON

scg-DeactivationPreferenceConfig-r17 SetupRelease {SCG-DeactivationPreferenceConfig-r17} OPTIONAL -- Need ON

]]

}

IDC-Config-r11 ::= SEQUENCE {

idc-Indication-r11 ENUMERATED {setup} OPTIONAL, -- Need OR

autonomousDenialParameters-r11 SEQUENCE {

autonomousDenialSubframes-r11 ENUMERATED {n2, n5, n10, n15,

n20, n30, spare2, spare1},

autonomousDenialValidity-r11 ENUMERATED {

sf200, sf500, sf1000, sf2000,

spare4, spare3, spare2, spare1}

} OPTIONAL, -- Need OR

...,

[[ idc-Indication-UL-CA-r11 ENUMERATED {setup} OPTIONAL -- Cond idc-Ind

]],

[[ idc-HardwareSharingIndication-r13 ENUMERATED {setup} OPTIONAL -- Need OR

]],

[[ idc-Indication-MRDC-r15 CHOICE{

release NULL,

setup CandidateServingFreqListNR-r15

} OPTIONAL -- Cond idc-Ind

]]

}

ObtainLocationConfig-r11 ::= SEQUENCE {

obtainLocation-r11 ENUMERATED {setup} OPTIONAL -- Need OR

}

PowerPrefIndicationConfig-r11 ::= CHOICE{

release NULL,

setup SEQUENCE{

powerPrefIndicationTimer-r11 ENUMERATED {s0, s0dot5, s1, s2, s5, s10, s20,

s30, s60, s90, s120, s300, s600, spare3,

spare2, spare1}

}

}

ReportProximityConfig-r9 ::= SEQUENCE {

proximityIndicationEUTRA-r9 ENUMERATED {enabled} OPTIONAL, -- Need OR

proximityIndicationUTRA-r9 ENUMERATED {enabled} OPTIONAL -- Need OR

}

CandidateServingFreqListNR-r15 ::= SEQUENCE (SIZE (1..maxFreqIDC-r11)) OF ARFCN-ValueNR-r15

SCG-DeactivationPreferenceConfig-r17 ::= SEQUENCE {

scg-DeactivationPreferenceProhibitTimer-r17

ENUMERATED {s0, s1, s2, s4, s8, s10, s20, s30,

s60, s120, s180, s240, s300, s600, s900, s1800}

}

-- ASN1STOP

| *OtherConfig* field descriptions |
| --- |
| ***ailc-BitConfig***  Indicates whether the UE is allowed to provide assistance information bit for local cache. If configured, the UE shall only apply to a DRB configured with 12-bit PDCP SN format as specified in TS 36.323 [8]. |
| ***autonomousDenialSubframes***  Indicates the maximum number of the UL subframes for which the UE is allowed to deny any UL transmission. Value n2 corresponds to 2 subframes, n5 to 5 subframes and so on. E-UTRAN does not configure autonomous denial for frequencies on which SCG cells are configured. |
| ***autonomousDenialValidity***  Indicates the validity period over which the UL autonomous denial subframes shall be counted. Value sf200 corresponds to 200 subframes, sf500 corresponds to 500 subframes and so on. |
| ***bw-PreferenceIndicationTimer***  Prohibit timer for bandwidth preference indication reporting. Value in seconds. Value s0 means prohibit timer is set to 0 second, value s0dot5 means prohibit timer is set to 0.5 second, value s1 means prohibit timer is set to 1 second and so on. |
| ***CandidateServingFreqListNR***  Indicates for each candidate NR serving cells, the center frequency around which UE is requested to report IDC issues for MR-DC. |
| ***delayBudgetReportingProhibitTimer***  Prohibit timer for delay budget reporting. Value in seconds. Value s0 means prohibit timer is set to 0 second, value s0dot4 means prohibit timer is set to 0.4 second, and so on. |
| ***idc-HardwareSharingIndication***  The field is used to indicate whether the UE is allowed indicate in *InDeviceCoexIndication* that the cause of the problems are due to hardware sharing, and whether the UE is allowed to omit the TDM assistance information. |
| ***idc-Indication***  The field is used to indicate whether the UE is configured to initiate transmission of the *InDeviceCoexIndication* message to the network. |
| ***idc-Indication-MRDC***  The field is used to indicate whether the UE is configured to provide IDC indications for MR-DC using the InDeviceCoexIndication message. |
| ***idc-Indication-UL-CA***  The field is used to indicate whether the UE is configured to provide IDC indications for UL CA using the *InDeviceCoexIndication* message. |
| ***measConfigAppLayerContainer***  The field contains configuration of application layer measurements, see Annex L (normative) in TS 26.247 [90] and clause 16.5 in TS 26.114 [99]. |
| ***serviceType***  Indicates the type of application layer measurement. Value qoe indicates Quality of Experience Measurement Collection for streaming services, value qoemtsi indicates Enhanced Quality of Experience Measurement Collection for MTSI. |
| ***obtainLocation***  Requests the UE to attempt to have detailed location information available using GNSS. E-UTRAN configures the field only if *includeLocationInfo* is configured for one or more measurements. |
| ***overheatingAssistanceConfig***  Configuration for the UE to report assistance information to inform the eNB about UE detected internal overheating. |
| ***overheatingAssistanceConfigForSCG***  The field is used to indicate whether the UE is configured to provide overheating assistance information for NR SCG. E-UTRAN configures value *TRUE* only when the UE is configured with an NR SCG. |
| ***overheatingIndicationProhibitTimer***  Prohibit timer for overheating assistance information reporting. Value in seconds. Value s0 means prohibit timer is set to 0 seconds, value s0dot5 means prohibit timer is set to 0.5 second, value s1 means prohibit timer is set to 1 second and so on. |
| ***powerPrefIndicationTimer***  Prohibit timer for Power Preference Indication reporting. Value in seconds. Value s0 means prohibit timer is set to 0 second, value s0dot5 means prohibit timer is set to 0.5 second, value s1 means prohibit timer is set to 1 second and so on. |
| ***reportProximityConfig***  Indicates, for each of the applicable RATs (EUTRA, UTRA), whether or not proximity indication is enabled for CSG member cell(s) of the concerned RAT. Note. |
| ***rlmReportTimer***  Prohibit timer for RLM event reporting, i.e. "early-out-of-sync" and "early-in-sync" event reporting, as specified in clause 5.6.10. Value in seconds. Value s0 means prohibit timer is set to 0 second, value s0dot5 means prohibit timer is set to 0.5 second, value s1 means prohibit timer is set to 1 second and so on. |
| ***rlmReportRep-MPDCCH***  The field is used to indicate whether the UE is configured to report excess repetitions on MPDCCH. |
| ***sps-AssistanceInfoReport***  Value TRUE indicates that the UE is allowed to report SPS-AssistanceInformation. If the *sl-V2X-SPS-Config* is provided by an E-UTRA *RRCConnectionReconfiguration* message embedded within an NR *RRCReconfiguration* for V2X sidelink communication (i.e. *sl-ConfigDedicatedEUTRA*) as in TS 38.331 [82], the network should configure the *otherConfig* and set this field to TRUE. |

NOTE: Enabling/ disabling of proximity indication includes enabling/ disabling of the related functionality e.g. autonomous search in connected mode.

| Conditional presence | Explanation |
| --- | --- |
| *idc-Ind* | The field is optionally present if *idc-Indication* is present, need OR. Otherwise the field is not present. |
| *overheating* | The field is optionally present, need ON, if the UE is configured with *overheatingAssistanceConfig*; if *overheatingAssistanceConfig* is included and set to *release*, the UE shall delete any existing value for this field; otherwise, the field is not present. |

#### – *RAN-AreaCode*

The *RAN-AreaCode* IE indicates RAN area code of the cell.

*RAN-AreaCode* information element

-- ASN1START

RAN-AreaCode-r15 ::= INTEGER (0..255)

-- ASN1STOP

#### – *RAND-CDMA2000 (1xRTT)*

The *RAND-CDMA200*0 concerns a random value, generated by the eNB, to be passed to the CDMA2000 upper layers.

*RAND-CDMA2000* information element

-- ASN1START

RAND-CDMA2000 ::= BIT STRING (SIZE (32))

-- ASN1STOP

#### – *RAT-Type*

The IE *RAT-Type* is used to indicate the radio access technology (RAT), including E‑UTRA, of the requested/ transferred UE capabilities. A separate value applies for some EUTRA-NR capabilities that are transferred by a separate UE capability container, used in case of MR-DC.

*RAT-Type* information element

-- ASN1START

RAT-Type ::= ENUMERATED {

eutra, utra, geran-cs, geran-ps, cdma2000-1XRTT,

nr, eutra-nr, spare1, ...}

-- ASN1STOP

#### – *ResumeIdentity*

The IE *ResumeIdentity* is used to identify the suspended UE context

*ResumeIdentity information* element

-- ASN1START

ResumeIdentity-r13 ::= BIT STRING (SIZE(40))

-- ASN1STOP

#### – *RRC-TransactionIdentifier*

The IE *RRC-TransactionIdentifier* is used, together with the message type, for the identification of an RRC procedure (transaction).

*RRC-TransactionIdentifier* information element

-- ASN1START

RRC-TransactionIdentifier ::= INTEGER (0..3)

-- ASN1STOP

#### – *SBAS-ID*

The IE *SBAS‑ID* is used to indicate a specific SBAS (see also TS 36.355 [54]).

*SBAS-ID* information element

-- ASN1START

SBAS-ID-r15 ::= SEQUENCE {

sbas-id-r15 ENUMERATED {waas, egnos, msas, gagan, ...},

...

}

-- ASN1STOP

#### – *ShortI-RNTI*

The *ShortI-RNTI* IE is used to identify the suspended UE context of a UE in RRC\_INACTIVE using fewer bits compared to *I-RNTI*.

*ShortI-RNTI* information element

-- ASN1START

ShortI-RNTI-r15 ::= BIT STRING (SIZE(24))

-- ASN1STOP

#### *– S-NSSAI*

The IE *S-NSSAI* identifies a Network Slice end to end and comprises a slice/service type and a slice differentiator, see TS 23.003 [27].

*S-NSSAI* information element

-- ASN1START

S-NSSAI-r15 ::= CHOICE{

sst BIT STRING (SIZE (8)),

sst-SD BIT STRING (SIZE (32))

}

-- ASN1STOP

| *S-NSSAI* field descriptions |
| --- |
| ***sst***  Indicates the *S-NSSAI* consists of Slice/Service Type, see TS 23.003 [27]. |
| ***sst-SD***  Indicates the *S-NSSAI* consists of Slice/Service Type and Slice Differentiator, see TS 23.003 [27]. |

#### – *S-TMSI*

The IE *S-TMSI* contains an S-Temporary Mobile Subscriber Identity, a temporary UE identity provided by the EPC which uniquely identifies the UE within the tracking area, see TS 23.003 [27].

*S-TMSI* information element

-- ASN1START

S-TMSI ::= SEQUENCE {

mmec MMEC,

m-TMSI BIT STRING (SIZE (32))

}

-- ASN1STOP

| *S-TMSI* field descriptions |
| --- |
| ***m-TMSI***  The first/leftmost bit of the bit string contains the most significant bit of the M-TMSI. |

#### – *TimeOffsetUTC*

The IE *TimeOffsetUTC* provides the time offset to the beginning of week (Monday 00:00:00 UTC). Units in seconds.

***TimeOffsetUTC* information element**

-- ASN1START

TimeOffsetUTC-r17 ::= INTEGER (0..1048575)

-- ASN1STOP

#### – *TraceReference*

The *TraceReference* contains parameter Trace Reference as defined in TS 32.422 [58].

*TraceReference* information element

-- ASN1START

TraceReference-r10 ::= SEQUENCE {

plmn-Identity-r10 PLMN-Identity,

traceId-r10 OCTET STRING (SIZE (3))

}

-- ASN1STOP

#### – *UE-CapabilityRAT-ContainerList*

The IE *UE-CapabilityRAT-ContainerList* contains list of containers, one for each RAT for which UE capabilities are transferred, if any.

*UE-CapabilityRAT-ContainerList* information element

-- ASN1START

UE-CapabilityRAT-ContainerList ::=SEQUENCE (SIZE (0..maxRAT-Capabilities)) OF UE-CapabilityRAT-Container

UE-CapabilityRAT-Container ::= SEQUENCE {

rat-Type RAT-Type,

ueCapabilityRAT-Container OCTET STRING

}

-- ASN1STOP

| *UECapabilityRAT-ContainerList* field descriptions |
| --- |
| ***ueCapabilityRAT-Container***  Container for the UE capabilities of the indicated RAT. The encoding is defined in the specification of each RAT:  For E‑UTRA: the encoding of UE capabilities is defined in IE *UE-EUTRA-Capability*.  For UTRA: the octet string contains the INTER RAT HANDOVER INFO message defined in TS 25.331 [19].  For GERAN CS: the octet string contains the concatenated string of the Mobile Station Classmark 2 and Mobile Station Classmark 3. The first 5 octets correspond to Mobile Station Classmark 2 and the following octets correspond to Mobile Station Classmark 3. The Mobile Station Classmark 2 is formatted as 'TLV' and is coded in the same way as the *Mobile Station Classmark 2* information element in TS 24.008 [49]. The first octet is the *Mobile station classmark 2 IEI* and its value shall be set to 33H. The second octet is the *Length of mobile station classmark 2* and its value shall be set to 3. The octet 3 contains the first octet of the value part of the *Mobile Station Classmark 2* information element, the octet 4 contains the second octet of the value part of the *Mobile Station Classmark 2* information element and so on. For each of these octets, the first/ leftmost/ most significant bit of the octet contains b8 of the corresponding octet of the Mobile Station Classmark 2. The Mobile Station Classmark 3 is formatted as 'V' and is coded in the same way as the value part in the *Mobile station classmark 3* information element in TS 24.008 [49]. The sixth octet of this octet string contains octet 1 of the value part of *Mobile station classmark 3*, the seventh of octet of this octet string contains octet 2 of the value part of *Mobile station classmark 3* and so on. Note.  For GERAN PS: the encoding of UE capabilities is formatted as 'V' and is coded in the same way as the value part in the *MS Radio Access Capability* information element in TS 24.008 [49].  For CDMA2000-1XRTT: the octet string contains the A21 Mobile Subscription Information and the encoding of this is defined in A.S0008 [33]. The A21 Mobile Subscription Information contains the supported CDMA2000 1xRTT band class and band sub-class information.  For NR: The octet string contains the IE *UE-NR-Capability* as defined in TS 38.331 [82].  For EUTRA-NR: The octet string contains the IE *UE-MRDC-Capability* as defined in TS 38.331 [82] |

NOTE: The value part is specified by means of CSN.1, which encoding results in a bit string, to which final padding may be appended up to the next octet boundary TS 24.008 [49]. The first/ leftmost bit of the CSN.1 bit string is placed in the first/ leftmost/ most significant bit of the first octet. This continues until the last bit of the CSN.1 bit string, which is placed in the last/ rightmost/ least significant bit of the last octet.

#### – *UE-EUTRA-Capability*

The IE *UE-EUTRA-Capability* is used to convey the E-UTRA UE Radio Access Capability Parameters, see TS 36.306 [5], and the Feature Group Indicators for mandatory features (defined in Annexes B.1 and C.1) to the network. The IE *UE-EUTRA-Capability* is transferred in E-UTRA or in another RAT.

NOTE 0: For (UE capability specific) guidelines on the use of keyword OPTIONAL, see Annex A.3.5.

*UE-EUTRA-Capability* information element

-- ASN1START

UE-EUTRA-Capability ::= SEQUENCE {

accessStratumRelease AccessStratumRelease,

ue-Category INTEGER (1..5),

pdcp-Parameters PDCP-Parameters,

phyLayerParameters PhyLayerParameters,

rf-Parameters RF-Parameters,

measParameters MeasParameters,

featureGroupIndicators BIT STRING (SIZE (32)) OPTIONAL,

interRAT-Parameters SEQUENCE {

utraFDD IRAT-ParametersUTRA-FDD OPTIONAL,

utraTDD128 IRAT-ParametersUTRA-TDD128 OPTIONAL,

utraTDD384 IRAT-ParametersUTRA-TDD384 OPTIONAL,

utraTDD768 IRAT-ParametersUTRA-TDD768 OPTIONAL,

geran IRAT-ParametersGERAN OPTIONAL,

cdma2000-HRPD IRAT-ParametersCDMA2000-HRPD OPTIONAL,

cdma2000-1xRTT IRAT-ParametersCDMA2000-1XRTT OPTIONAL

},

nonCriticalExtension UE-EUTRA-Capability-v920-IEs OPTIONAL

}

-- Late non critical extensions

UE-EUTRA-Capability-v9a0-IEs ::= SEQUENCE {

featureGroupIndRel9Add-r9 BIT STRING (SIZE (32)) OPTIONAL,

fdd-Add-UE-EUTRA-Capabilities-r9 UE-EUTRA-CapabilityAddXDD-Mode-r9 OPTIONAL,

tdd-Add-UE-EUTRA-Capabilities-r9 UE-EUTRA-CapabilityAddXDD-Mode-r9 OPTIONAL,

nonCriticalExtension UE-EUTRA-Capability-v9c0-IEs OPTIONAL

}

UE-EUTRA-Capability-v9c0-IEs ::= SEQUENCE {

interRAT-ParametersUTRA-v9c0 IRAT-ParametersUTRA-v9c0 OPTIONAL,

nonCriticalExtension UE-EUTRA-Capability-v9d0-IEs OPTIONAL

}

UE-EUTRA-Capability-v9d0-IEs ::= SEQUENCE {

phyLayerParameters-v9d0 PhyLayerParameters-v9d0 OPTIONAL,

nonCriticalExtension UE-EUTRA-Capability-v9e0-IEs OPTIONAL

}

UE-EUTRA-Capability-v9e0-IEs ::= SEQUENCE {

rf-Parameters-v9e0 RF-Parameters-v9e0 OPTIONAL,

nonCriticalExtension UE-EUTRA-Capability-v9h0-IEs OPTIONAL

}

UE-EUTRA-Capability-v9h0-IEs ::= SEQUENCE {

interRAT-ParametersUTRA-v9h0 IRAT-ParametersUTRA-v9h0 OPTIONAL,

-- Following field is only to be used for late REL-9 extensions

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension UE-EUTRA-Capability-v10c0-IEs OPTIONAL

}

UE-EUTRA-Capability-v10c0-IEs ::= SEQUENCE {

otdoa-PositioningCapabilities-r10 OTDOA-PositioningCapabilities-r10 OPTIONAL,

nonCriticalExtension UE-EUTRA-Capability-v10f0-IEs OPTIONAL

}

UE-EUTRA-Capability-v10f0-IEs ::= SEQUENCE {

rf-Parameters-v10f0 RF-Parameters-v10f0 OPTIONAL,

nonCriticalExtension UE-EUTRA-Capability-v10i0-IEs OPTIONAL

}

UE-EUTRA-Capability-v10i0-IEs ::= SEQUENCE {

rf-Parameters-v10i0 RF-Parameters-v10i0 OPTIONAL,

-- Following field is only to be used for late REL-10 extensions

lateNonCriticalExtension OCTET STRING (CONTAINING UE-EUTRA-Capability-v10j0-IEs) OPTIONAL,

nonCriticalExtension UE-EUTRA-Capability-v11d0-IEs OPTIONAL

}

UE-EUTRA-Capability-v10j0-IEs ::= SEQUENCE {

rf-Parameters-v10j0 RF-Parameters-v10j0 OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

UE-EUTRA-Capability-v11d0-IEs ::= SEQUENCE {

rf-Parameters-v11d0 RF-Parameters-v11d0 OPTIONAL,

otherParameters-v11d0 Other-Parameters-v11d0 OPTIONAL,

nonCriticalExtension UE-EUTRA-Capability-v11x0-IEs OPTIONAL

}

UE-EUTRA-Capability-v11x0-IEs ::= SEQUENCE {

-- Following field is only to be used for late REL-11 extensions

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension UE-EUTRA-Capability-v12b0-IEs OPTIONAL

}

UE-EUTRA-Capability-v12b0-IEs ::= SEQUENCE {

rf-Parameters-v12b0 RF-Parameters-v12b0 OPTIONAL,

nonCriticalExtension UE-EUTRA-Capability-v12x0-IEs OPTIONAL

}

UE-EUTRA-Capability-v12x0-IEs ::= SEQUENCE {

-- Following field is only to be used for late REL-12 extensions

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension UE-EUTRA-Capability-v1370-IEs OPTIONAL

}

UE-EUTRA-Capability-v1370-IEs ::= SEQUENCE {

ce-Parameters-v1370 CE-Parameters-v1370 OPTIONAL,

fdd-Add-UE-EUTRA-Capabilities-v1370 UE-EUTRA-CapabilityAddXDD-Mode-v1370 OPTIONAL,

tdd-Add-UE-EUTRA-Capabilities-v1370 UE-EUTRA-CapabilityAddXDD-Mode-v1370 OPTIONAL,

nonCriticalExtension UE-EUTRA-Capability-v1380-IEs OPTIONAL

}

UE-EUTRA-Capability-v1380-IEs ::= SEQUENCE {

rf-Parameters-v1380 RF-Parameters-v1380 OPTIONAL,

ce-Parameters-v1380 CE-Parameters-v1380,

fdd-Add-UE-EUTRA-Capabilities-v1380 UE-EUTRA-CapabilityAddXDD-Mode-v1380,

tdd-Add-UE-EUTRA-Capabilities-v1380 UE-EUTRA-CapabilityAddXDD-Mode-v1380,

nonCriticalExtension UE-EUTRA-Capability-v1390-IEs OPTIONAL

}

UE-EUTRA-Capability-v1390-IEs ::= SEQUENCE {

rf-Parameters-v1390 RF-Parameters-v1390 OPTIONAL,

nonCriticalExtension UE-EUTRA-Capability-v13e0a-IEs OPTIONAL

}

UE-EUTRA-Capability-v13e0a-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING (CONTAINING UE-EUTRA-Capability-v13e0b-IEs) OPTIONAL,

nonCriticalExtension UE-EUTRA-Capability-v1470-IEs OPTIONAL

}

UE-EUTRA-Capability-v13e0b-IEs ::= SEQUENCE {

phyLayerParameters-v13e0 PhyLayerParameters-v13e0,

-- Following field is only to be used for late REL-13 extensions

nonCriticalExtension SEQUENCE {} OPTIONAL

}

UE-EUTRA-Capability-v1470-IEs ::= SEQUENCE {

mbms-Parameters-v1470 MBMS-Parameters-v1470 OPTIONAL,

phyLayerParameters-v1470 PhyLayerParameters-v1470 OPTIONAL,

rf-Parameters-v1470 RF-Parameters-v1470 OPTIONAL,

nonCriticalExtension UE-EUTRA-Capability-v14a0-IEs OPTIONAL

}

UE-EUTRA-Capability-v14a0-IEs ::= SEQUENCE {

phyLayerParameters-v14a0 PhyLayerParameters-v14a0,

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

nonCriticalExtension UE-EUTRA-Capability-v14b0-IEs OPTIONAL

}

UE-EUTRA-Capability-v14b0-IEs ::= SEQUENCE {

rf-Parameters-v14b0 RF-Parameters-v14b0 OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- Regular non critical extensions

UE-EUTRA-Capability-v920-IEs ::= SEQUENCE {

phyLayerParameters-v920 PhyLayerParameters-v920,

interRAT-ParametersGERAN-v920 IRAT-ParametersGERAN-v920,

interRAT-ParametersUTRA-v920 IRAT-ParametersUTRA-v920 OPTIONAL,

interRAT-ParametersCDMA2000-v920 IRAT-ParametersCDMA2000-1XRTT-v920 OPTIONAL,

deviceType-r9 ENUMERATED {noBenFromBatConsumpOpt} OPTIONAL,

csg-ProximityIndicationParameters-r9 CSG-ProximityIndicationParameters-r9,

neighCellSI-AcquisitionParameters-r9 NeighCellSI-AcquisitionParameters-r9,

son-Parameters-r9 SON-Parameters-r9,

nonCriticalExtension UE-EUTRA-Capability-v940-IEs OPTIONAL

}

UE-EUTRA-Capability-v940-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING (CONTAINING UE-EUTRA-Capability-v9a0-IEs) OPTIONAL,

nonCriticalExtension UE-EUTRA-Capability-v1020-IEs OPTIONAL

}

UE-EUTRA-Capability-v1020-IEs ::= SEQUENCE {

ue-Category-v1020 INTEGER (6..8) OPTIONAL,

phyLayerParameters-v1020 PhyLayerParameters-v1020 OPTIONAL,

rf-Parameters-v1020 RF-Parameters-v1020 OPTIONAL,

measParameters-v1020 MeasParameters-v1020 OPTIONAL,

featureGroupIndRel10-r10 BIT STRING (SIZE (32)) OPTIONAL,

interRAT-ParametersCDMA2000-v1020 IRAT-ParametersCDMA2000-1XRTT-v1020 OPTIONAL,

ue-BasedNetwPerfMeasParameters-r10 UE-BasedNetwPerfMeasParameters-r10 OPTIONAL,

interRAT-ParametersUTRA-TDD-v1020 IRAT-ParametersUTRA-TDD-v1020 OPTIONAL,

nonCriticalExtension UE-EUTRA-Capability-v1060-IEs OPTIONAL

}

UE-EUTRA-Capability-v1060-IEs ::= SEQUENCE {

fdd-Add-UE-EUTRA-Capabilities-v1060 UE-EUTRA-CapabilityAddXDD-Mode-v1060 OPTIONAL,

tdd-Add-UE-EUTRA-Capabilities-v1060 UE-EUTRA-CapabilityAddXDD-Mode-v1060 OPTIONAL,

rf-Parameters-v1060 RF-Parameters-v1060 OPTIONAL,

nonCriticalExtension UE-EUTRA-Capability-v1090-IEs OPTIONAL

}

UE-EUTRA-Capability-v1090-IEs ::= SEQUENCE {

rf-Parameters-v1090 RF-Parameters-v1090 OPTIONAL,

nonCriticalExtension UE-EUTRA-Capability-v1130-IEs OPTIONAL

}

UE-EUTRA-Capability-v1130-IEs ::= SEQUENCE {

pdcp-Parameters-v1130 PDCP-Parameters-v1130,

phyLayerParameters-v1130 PhyLayerParameters-v1130 OPTIONAL,

rf-Parameters-v1130 RF-Parameters-v1130,

measParameters-v1130 MeasParameters-v1130,

interRAT-ParametersCDMA2000-v1130 IRAT-ParametersCDMA2000-v1130,

otherParameters-r11 Other-Parameters-r11,

fdd-Add-UE-EUTRA-Capabilities-v1130 UE-EUTRA-CapabilityAddXDD-Mode-v1130 OPTIONAL,

tdd-Add-UE-EUTRA-Capabilities-v1130 UE-EUTRA-CapabilityAddXDD-Mode-v1130 OPTIONAL,

nonCriticalExtension UE-EUTRA-Capability-v1170-IEs OPTIONAL

}

UE-EUTRA-Capability-v1170-IEs ::= SEQUENCE {

phyLayerParameters-v1170 PhyLayerParameters-v1170 OPTIONAL,

ue-Category-v1170 INTEGER (9..10) OPTIONAL,

nonCriticalExtension UE-EUTRA-Capability-v1180-IEs OPTIONAL

}

UE-EUTRA-Capability-v1180-IEs ::= SEQUENCE {

rf-Parameters-v1180 RF-Parameters-v1180 OPTIONAL,

mbms-Parameters-r11 MBMS-Parameters-r11 OPTIONAL,

fdd-Add-UE-EUTRA-Capabilities-v1180 UE-EUTRA-CapabilityAddXDD-Mode-v1180 OPTIONAL,

tdd-Add-UE-EUTRA-Capabilities-v1180 UE-EUTRA-CapabilityAddXDD-Mode-v1180 OPTIONAL,

nonCriticalExtension UE-EUTRA-Capability-v11a0-IEs OPTIONAL

}

UE-EUTRA-Capability-v11a0-IEs ::= SEQUENCE {

ue-Category-v11a0 INTEGER (11..12) OPTIONAL,

measParameters-v11a0 MeasParameters-v11a0 OPTIONAL,

nonCriticalExtension UE-EUTRA-Capability-v1250-IEs OPTIONAL

}

UE-EUTRA-Capability-v1250-IEs ::= SEQUENCE {

phyLayerParameters-v1250 PhyLayerParameters-v1250 OPTIONAL,

rf-Parameters-v1250 RF-Parameters-v1250 OPTIONAL,

rlc-Parameters-r12 RLC-Parameters-r12 OPTIONAL,

ue-BasedNetwPerfMeasParameters-v1250 UE-BasedNetwPerfMeasParameters-v1250 OPTIONAL,

ue-CategoryDL-r12 INTEGER (0..14) OPTIONAL,

ue-CategoryUL-r12 INTEGER (0..13) OPTIONAL,

wlan-IW-Parameters-r12 WLAN-IW-Parameters-r12 OPTIONAL,

measParameters-v1250 MeasParameters-v1250 OPTIONAL,

dc-Parameters-r12 DC-Parameters-r12 OPTIONAL,

mbms-Parameters-v1250 MBMS-Parameters-v1250 OPTIONAL,

mac-Parameters-r12 MAC-Parameters-r12 OPTIONAL,

fdd-Add-UE-EUTRA-Capabilities-v1250 UE-EUTRA-CapabilityAddXDD-Mode-v1250 OPTIONAL,

tdd-Add-UE-EUTRA-Capabilities-v1250 UE-EUTRA-CapabilityAddXDD-Mode-v1250 OPTIONAL,

sl-Parameters-r12 SL-Parameters-r12 OPTIONAL,

nonCriticalExtension UE-EUTRA-Capability-v1260-IEs OPTIONAL

}

UE-EUTRA-Capability-v1260-IEs ::= SEQUENCE {

ue-CategoryDL-v1260 INTEGER (15..16) OPTIONAL,

nonCriticalExtension UE-EUTRA-Capability-v1270-IEs OPTIONAL

}

UE-EUTRA-Capability-v1270-IEs ::= SEQUENCE {

rf-Parameters-v1270 RF-Parameters-v1270 OPTIONAL,

nonCriticalExtension UE-EUTRA-Capability-v1280-IEs OPTIONAL

}

UE-EUTRA-Capability-v1280-IEs ::= SEQUENCE {

phyLayerParameters-v1280 PhyLayerParameters-v1280 OPTIONAL,

nonCriticalExtension UE-EUTRA-Capability-v1310-IEs OPTIONAL

}

UE-EUTRA-Capability-v1310-IEs ::= SEQUENCE {

ue-CategoryDL-v1310 ENUMERATED {n17, m1} OPTIONAL,

ue-CategoryUL-v1310 ENUMERATED {n14, m1} OPTIONAL,

pdcp-Parameters-v1310 PDCP-Parameters-v1310,

rlc-Parameters-v1310 RLC-Parameters-v1310,

mac-Parameters-v1310 MAC-Parameters-v1310 OPTIONAL,

phyLayerParameters-v1310 PhyLayerParameters-v1310 OPTIONAL,

rf-Parameters-v1310 RF-Parameters-v1310 OPTIONAL,

measParameters-v1310 MeasParameters-v1310 OPTIONAL,

dc-Parameters-v1310 DC-Parameters-v1310 OPTIONAL,

sl-Parameters-v1310 SL-Parameters-v1310 OPTIONAL,

scptm-Parameters-r13 SCPTM-Parameters-r13 OPTIONAL,

ce-Parameters-r13 CE-Parameters-r13 OPTIONAL,

interRAT-ParametersWLAN-r13IRAT-ParametersWLAN-r13,

laa-Parameters-r13 LAA-Parameters-r13 OPTIONAL,

lwa-Parameters-r13 LWA-Parameters-r13 OPTIONAL,

wlan-IW-Parameters-v1310 WLAN-IW-Parameters-v1310,

lwip-Parameters-r13 LWIP-Parameters-r13,

fdd-Add-UE-EUTRA-Capabilities-v1310 UE-EUTRA-CapabilityAddXDD-Mode-v1310 OPTIONAL,

tdd-Add-UE-EUTRA-Capabilities-v1310 UE-EUTRA-CapabilityAddXDD-Mode-v1310 OPTIONAL,

nonCriticalExtension UE-EUTRA-Capability-v1320-IEs OPTIONAL

}

UE-EUTRA-Capability-v1320-IEs ::= SEQUENCE {

ce-Parameters-v1320 CE-Parameters-v1320 OPTIONAL,

phyLayerParameters-v1320 PhyLayerParameters-v1320 OPTIONAL,

rf-Parameters-v1320 RF-Parameters-v1320 OPTIONAL,

fdd-Add-UE-EUTRA-Capabilities-v1320 UE-EUTRA-CapabilityAddXDD-Mode-v1320 OPTIONAL,

tdd-Add-UE-EUTRA-Capabilities-v1320 UE-EUTRA-CapabilityAddXDD-Mode-v1320 OPTIONAL,

nonCriticalExtension UE-EUTRA-Capability-v1330-IEs OPTIONAL

}

UE-EUTRA-Capability-v1330-IEs ::= SEQUENCE {

ue-CategoryDL-v1330 INTEGER (18..19) OPTIONAL,

phyLayerParameters-v1330 PhyLayerParameters-v1330 OPTIONAL,

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

nonCriticalExtension UE-EUTRA-Capability-v1340-IEs OPTIONAL

}

UE-EUTRA-Capability-v1340-IEs ::= SEQUENCE {

ue-CategoryUL-v1340 INTEGER (15) OPTIONAL,

nonCriticalExtension UE-EUTRA-Capability-v1350-IEs OPTIONAL

}

UE-EUTRA-Capability-v1350-IEs ::= SEQUENCE {

ue-CategoryDL-v1350 ENUMERATED {oneBis} OPTIONAL,

ue-CategoryUL-v1350 ENUMERATED {oneBis} OPTIONAL,

ce-Parameters-v1350 CE-Parameters-v1350,

nonCriticalExtension UE-EUTRA-Capability-v1360-IEs OPTIONAL

}

UE-EUTRA-Capability-v1360-IEs ::= SEQUENCE {

other-Parameters-v1360 Other-Parameters-v1360 OPTIONAL,

nonCriticalExtension UE-EUTRA-Capability-v1430-IEs OPTIONAL

}

UE-EUTRA-Capability-v1430-IEs ::= SEQUENCE {

phyLayerParameters-v1430 PhyLayerParameters-v1430,

ue-CategoryDL-v1430 ENUMERATED {m2} OPTIONAL,

ue-CategoryUL-v1430 ENUMERATED {n16, n17, n18, n19, n20, m2} OPTIONAL,

ue-CategoryUL-v1430b ENUMERATED {n21} OPTIONAL,

mac-Parameters-v1430 MAC-Parameters-v1430 OPTIONAL,

measParameters-v1430 MeasParameters-v1430 OPTIONAL,

pdcp-Parameters-v1430 PDCP-Parameters-v1430 OPTIONAL,

rlc-Parameters-v1430 RLC-Parameters-v1430,

rf-Parameters-v1430 RF-Parameters-v1430 OPTIONAL,

laa-Parameters-v1430 LAA-Parameters-v1430 OPTIONAL,

lwa-Parameters-v1430 LWA-Parameters-v1430 OPTIONAL,

lwip-Parameters-v1430 LWIP-Parameters-v1430 OPTIONAL,

otherParameters-v1430 Other-Parameters-v1430,

mmtel-Parameters-r14 MMTEL-Parameters-r14 OPTIONAL,

mobilityParameters-r14 MobilityParameters-r14 OPTIONAL,

ce-Parameters-v1430 CE-Parameters-v1430,

fdd-Add-UE-EUTRA-Capabilities-v1430 UE-EUTRA-CapabilityAddXDD-Mode-v1430 OPTIONAL,

tdd-Add-UE-EUTRA-Capabilities-v1430 UE-EUTRA-CapabilityAddXDD-Mode-v1430 OPTIONAL,

mbms-Parameters-v1430 MBMS-Parameters-v1430 OPTIONAL,

sl-Parameters-v1430 SL-Parameters-v1430 OPTIONAL,

ue-BasedNetwPerfMeasParameters-v1430 UE-BasedNetwPerfMeasParameters-v1430 OPTIONAL,

highSpeedEnhParameters-r14 HighSpeedEnhParameters-r14 OPTIONAL,

nonCriticalExtension UE-EUTRA-Capability-v1440-IEs OPTIONAL

}

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

lwa-Parameters-v1440 LWA-Parameters-v1440,

mac-Parameters-v1440 MAC-Parameters-v1440,

nonCriticalExtension UE-EUTRA-Capability-v1450-IEs OPTIONAL

}

UE-EUTRA-Capability-v1450-IEs ::= SEQUENCE {

phyLayerParameters-v1450 PhyLayerParameters-v1450 OPTIONAL,

rf-Parameters-v1450 RF-Parameters-v1450 OPTIONAL,

otherParameters-v1450 OtherParameters-v1450,

ue-CategoryDL-v1450 INTEGER (20) OPTIONAL,

nonCriticalExtension UE-EUTRA-Capability-v1460-IEs OPTIONAL

}

UE-EUTRA-Capability-v1460-IEs ::= SEQUENCE {

ue-CategoryDL-v1460 INTEGER (21) OPTIONAL,

otherParameters-v1460 Other-Parameters-v1460,

nonCriticalExtension UE-EUTRA-Capability-v1510-IEs OPTIONAL

}

UE-EUTRA-Capability-v1510-IEs ::= SEQUENCE {

irat-ParametersNR-r15 IRAT-ParametersNR-r15 OPTIONAL,

featureSetsEUTRA-r15 FeatureSetsEUTRA-r15 OPTIONAL,

pdcp-ParametersNR-r15 PDCP-ParametersNR-r15 OPTIONAL,

fdd-Add-UE-EUTRA-Capabilities-v1510 UE-EUTRA-CapabilityAddXDD-Mode-v1510 OPTIONAL,

tdd-Add-UE-EUTRA-Capabilities-v1510 UE-EUTRA-CapabilityAddXDD-Mode-v1510 OPTIONAL,

nonCriticalExtension UE-EUTRA-Capability-v1520-IEs OPTIONAL

}

UE-EUTRA-Capability-v1520-IEs ::= SEQUENCE {

measParameters-v1520 MeasParameters-v1520,

nonCriticalExtension UE-EUTRA-Capability-v1530-IEs OPTIONAL

}

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

measParameters-v1530 MeasParameters-v1530 OPTIONAL,

otherParameters-v1530 Other-Parameters-v1530 OPTIONAL,

neighCellSI-AcquisitionParameters-v1530 NeighCellSI-AcquisitionParameters-v1530 OPTIONAL,

mac-Parameters-v1530 MAC-Parameters-v1530 OPTIONAL,

phyLayerParameters-v1530 PhyLayerParameters-v1530 OPTIONAL,

rf-Parameters-v1530 RF-Parameters-v1530 OPTIONAL,

pdcp-Parameters-v1530 PDCP-Parameters-v1530 OPTIONAL,

ue-CategoryDL-v1530 INTEGER (22..26) OPTIONAL,

ue-BasedNetwPerfMeasParameters-v1530 UE-BasedNetwPerfMeasParameters-v1530 OPTIONAL,

rlc-Parameters-v1530 RLC-Parameters-v1530 OPTIONAL,

sl-Parameters-v1530 SL-Parameters-v1530 OPTIONAL,

extendedNumberOfDRBs-r15 ENUMERATED {supported} OPTIONAL,

reducedCP-Latency-r15 ENUMERATED {supported} OPTIONAL,

laa-Parameters-v1530 LAA-Parameters-v1530 OPTIONAL,

ue-CategoryUL-v1530 INTEGER (22..26) OPTIONAL,

fdd-Add-UE-EUTRA-Capabilities-v1530 UE-EUTRA-CapabilityAddXDD-Mode-v1530 OPTIONAL,

tdd-Add-UE-EUTRA-Capabilities-v1530 UE-EUTRA-CapabilityAddXDD-Mode-v1530 OPTIONAL,

nonCriticalExtension UE-EUTRA-Capability-v1540-IEs OPTIONAL

}

UE-EUTRA-Capability-v1540-IEs ::= SEQUENCE {

phyLayerParameters-v1540 PhyLayerParameters-v1540 OPTIONAL,

otherParameters-v1540 Other-Parameters-v1540,

fdd-Add-UE-EUTRA-Capabilities-v1540 UE-EUTRA-CapabilityAddXDD-Mode-v1540 OPTIONAL,

tdd-Add-UE-EUTRA-Capabilities-v1540 UE-EUTRA-CapabilityAddXDD-Mode-v1540 OPTIONAL,

sl-Parameters-v1540 SL-Parameters-v1540 OPTIONAL,

irat-ParametersNR-v1540 IRAT-ParametersNR-v1540 OPTIONAL,

nonCriticalExtension UE-EUTRA-Capability-v1550-IEs OPTIONAL

}

UE-EUTRA-Capability-v1550-IEs ::= SEQUENCE {

neighCellSI-AcquisitionParameters-v1550 NeighCellSI-AcquisitionParameters-v1550 OPTIONAL,

phyLayerParameters-v1550 PhyLayerParameters-v1550,

mac-Parameters-v1550 MAC-Parameters-v1550,

fdd-Add-UE-EUTRA-Capabilities-v1550 UE-EUTRA-CapabilityAddXDD-Mode-v1550,

tdd-Add-UE-EUTRA-Capabilities-v1550 UE-EUTRA-CapabilityAddXDD-Mode-v1550,

nonCriticalExtension UE-EUTRA-Capability-v1560-IEs OPTIONAL

}

UE-EUTRA-Capability-v1560-IEs ::= SEQUENCE {

pdcp-ParametersNR-v1560 PDCP-ParametersNR-v1560,

irat-ParametersNR-v1560 IRAT-ParametersNR-v1560,

appliedCapabilityFilterCommon-r15 OCTET STRING OPTIONAL,

fdd-Add-UE-EUTRA-Capabilities-v1560 UE-EUTRA-CapabilityAddXDD-Mode-v1560,

tdd-Add-UE-EUTRA-Capabilities-v1560 UE-EUTRA-CapabilityAddXDD-Mode-v1560,

nonCriticalExtension UE-EUTRA-Capability-v1570-IEs OPTIONAL

}

UE-EUTRA-Capability-v1570-IEs ::= SEQUENCE {

rf-Parameters-v1570 RF-Parameters-v1570 OPTIONAL,

irat-ParametersNR-v1570 IRAT-ParametersNR-v1570 OPTIONAL,

nonCriticalExtension UE-EUTRA-Capability-v15a0-IEs OPTIONAL

}

UE-EUTRA-Capability-v15a0-IEs ::= SEQUENCE {

neighCellSI-AcquisitionParameters-v15a0 NeighCellSI-AcquisitionParameters-v15a0,

eutra-5GC-Parameters-r15 EUTRA-5GC-Parameters-r15 OPTIONAL,

fdd-Add-UE-EUTRA-Capabilities-v15a0 UE-EUTRA-CapabilityAddXDD-Mode-v15a0 OPTIONAL,

tdd-Add-UE-EUTRA-Capabilities-v15a0 UE-EUTRA-CapabilityAddXDD-Mode-v15a0 OPTIONAL,

nonCriticalExtension UE-EUTRA-Capability-v1610-IEs OPTIONAL

}

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

highSpeedEnhParameters-v1610 HighSpeedEnhParameters-v1610 OPTIONAL,

neighCellSI-AcquisitionParameters-v1610 NeighCellSI-AcquisitionParameters-v1610 OPTIONAL,

mbms-Parameters-v1610 MBMS-Parameters-v1610 OPTIONAL,

pdcp-Parameters-v1610 PDCP-Parameters-v1610 OPTIONAL,

mac-Parameters-v1610 MAC-Parameters-v1610 OPTIONAL,

phyLayerParameters-v1610 PhyLayerParameters-v1610 OPTIONAL,

measParameters-v1610 MeasParameters-v1610 OPTIONAL,

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

eutra-5GC-Parameters-v1610 EUTRA-5GC-Parameters-v1610 OPTIONAL,

otherParameters-v1610 Other-Parameters-v1610 OPTIONAL,

dl-DedicatedMessageSegmentation-r16 ENUMERATED {supported} OPTIONAL,

mmtel-Parameters-v1610 MMTEL-Parameters-v1610,

irat-ParametersNR-v1610 IRAT-ParametersNR-v1610 OPTIONAL,

rf-Parameters-v1610 RF-Parameters-v1610 OPTIONAL,

mobilityParameters-v1610 MobilityParameters-v1610 OPTIONAL,

ue-BasedNetwPerfMeasParameters-v1610 UE-BasedNetwPerfMeasParameters-v1610,

sl-Parameters-v1610 SL-Parameters-v1610 OPTIONAL,

fdd-Add-UE-EUTRA-Capabilities-v1610 UE-EUTRA-CapabilityAddXDD-Mode-v1610 OPTIONAL,

tdd-Add-UE-EUTRA-Capabilities-v1610 UE-EUTRA-CapabilityAddXDD-Mode-v1610 OPTIONAL,

nonCriticalExtension UE-EUTRA-Capability-v1630-IEs OPTIONAL

}

UE-EUTRA-Capability-v1630-IEs ::= SEQUENCE {

rf-Parameters-v1630 RF-Parameters-v1630 OPTIONAL,

sl-Parameters-v1630 SL-Parameters-v1630 OPTIONAL,

earlySecurityReactivation-r16 ENUMERATED {supported} OPTIONAL,

mac-Parameters-v1630 MAC-Parameters-v1630,

measParameters-v1630 MeasParameters-v1630 OPTIONAL,

fdd-Add-UE-EUTRA-Capabilities-v1630 UE-EUTRA-CapabilityAddXDD-Mode-v1630,

tdd-Add-UE-EUTRA-Capabilities-v1630 UE-EUTRA-CapabilityAddXDD-Mode-v1630,

nonCriticalExtension UE-EUTRA-Capability-v1650-IEs OPTIONAL

}

UE-EUTRA-Capability-v1650-IEs ::= SEQUENCE {

otherParameters-v1650 Other-Parameters-v1650 OPTIONAL,

nonCriticalExtension UE-EUTRA-Capability-v1660-IEs OPTIONAL

}

UE-EUTRA-Capability-v1660-IEs ::= SEQUENCE {

irat-ParametersNR-v1660 IRAT-ParametersNR-v1660,

nonCriticalExtension UE-EUTRA-Capability-v1700-IEs OPTIONAL

}

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

measParameters-v1700 MeasParameters-v1700 OPTIONAL,

ue-BasedNetwPerfMeasParameters-v1700 UE-BasedNetwPerfMeasParameters-v1700 OPTIONAL,

phyLayerParameters-v1700 PhyLayerParameters-v1700,

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

irat-ParametersNR-v1700 IRAT-ParametersNR-v1700 OPTIONAL,

mbms-Parameters-v1700 MBMS-Parameters-v1700,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

UE-EUTRA-CapabilityAddXDD-Mode-r9 ::= SEQUENCE {

phyLayerParameters-r9 PhyLayerParameters OPTIONAL,

featureGroupIndicators-r9 BIT STRING (SIZE (32)) OPTIONAL,

featureGroupIndRel9Add-r9 BIT STRING (SIZE (32)) OPTIONAL,

interRAT-ParametersGERAN-r9 IRAT-ParametersGERAN OPTIONAL,

interRAT-ParametersUTRA-r9 IRAT-ParametersUTRA-v920 OPTIONAL,

interRAT-ParametersCDMA2000-r9 IRAT-ParametersCDMA2000-1XRTT-v920 OPTIONAL,

neighCellSI-AcquisitionParameters-r9 NeighCellSI-AcquisitionParameters-r9 OPTIONAL,

...

}

UE-EUTRA-CapabilityAddXDD-Mode-v1060 ::= SEQUENCE {

phyLayerParameters-v1060 PhyLayerParameters-v1020 OPTIONAL,

featureGroupIndRel10-v1060 BIT STRING (SIZE (32)) OPTIONAL,

interRAT-ParametersCDMA2000-v1060 IRAT-ParametersCDMA2000-1XRTT-v1020 OPTIONAL,

interRAT-ParametersUTRA-TDD-v1060 IRAT-ParametersUTRA-TDD-v1020 OPTIONAL,

...,

[[ otdoa-PositioningCapabilities-r10 OTDOA-PositioningCapabilities-r10 OPTIONAL

]]

}

UE-EUTRA-CapabilityAddXDD-Mode-v1130 ::= SEQUENCE {

phyLayerParameters-v1130 PhyLayerParameters-v1130 OPTIONAL,

measParameters-v1130 MeasParameters-v1130 OPTIONAL,

otherParameters-r11 Other-Parameters-r11 OPTIONAL,

...

}

UE-EUTRA-CapabilityAddXDD-Mode-v1180 ::= SEQUENCE {

mbms-Parameters-r11 MBMS-Parameters-r11

}

UE-EUTRA-CapabilityAddXDD-Mode-v1250 ::= SEQUENCE {

phyLayerParameters-v1250 PhyLayerParameters-v1250 OPTIONAL,

measParameters-v1250 MeasParameters-v1250 OPTIONAL

}

UE-EUTRA-CapabilityAddXDD-Mode-v1310 ::= SEQUENCE {

phyLayerParameters-v1310 PhyLayerParameters-v1310 OPTIONAL

}

UE-EUTRA-CapabilityAddXDD-Mode-v1320 ::= SEQUENCE {

phyLayerParameters-v1320 PhyLayerParameters-v1320 OPTIONAL,

scptm-Parameters-r13 SCPTM-Parameters-r13 OPTIONAL

}

UE-EUTRA-CapabilityAddXDD-Mode-v1370 ::= SEQUENCE {

ce-Parameters-v1370 CE-Parameters-v1370 OPTIONAL

}

UE-EUTRA-CapabilityAddXDD-Mode-v1380 ::= SEQUENCE {

ce-Parameters-v1380 CE-Parameters-v1380

}

UE-EUTRA-CapabilityAddXDD-Mode-v1430 ::= SEQUENCE {

phyLayerParameters-v1430 PhyLayerParameters-v1430 OPTIONAL,

mmtel-Parameters-r14 MMTEL-Parameters-r14 OPTIONAL

}

UE-EUTRA-CapabilityAddXDD-Mode-v1510 ::= SEQUENCE {

pdcp-ParametersNR-r15 PDCP-ParametersNR-r15 OPTIONAL

}

UE-EUTRA-CapabilityAddXDD-Mode-v1530 ::= SEQUENCE {

neighCellSI-AcquisitionParameters-v1530 NeighCellSI-AcquisitionParameters-v1530 OPTIONAL,

reducedCP-Latency-r15 ENUMERATED {supported} OPTIONAL

}

UE-EUTRA-CapabilityAddXDD-Mode-v1540 ::= SEQUENCE {

eutra-5GC-Parameters-r15 EUTRA-5GC-Parameters-r15 OPTIONAL,

irat-ParametersNR-v1540 IRAT-ParametersNR-v1540 OPTIONAL

}

UE-EUTRA-CapabilityAddXDD-Mode-v1550 ::= SEQUENCE {

neighCellSI-AcquisitionParameters-v1550 NeighCellSI-AcquisitionParameters-v1550 OPTIONAL

}

UE-EUTRA-CapabilityAddXDD-Mode-v1560 ::= SEQUENCE {

pdcp-ParametersNR-v1560 PDCP-ParametersNR-v1560

}

UE-EUTRA-CapabilityAddXDD-Mode-v15a0 ::= SEQUENCE {

phyLayerParameters-v1530 PhyLayerParameters-v1530 OPTIONAL,

phyLayerParameters-v1540 PhyLayerParameters-v1540 OPTIONAL,

phyLayerParameters-v1550 PhyLayerParameters-v1550 OPTIONAL,

neighCellSI-AcquisitionParameters-v15a0 NeighCellSI-AcquisitionParameters-v15a0

}

UE-EUTRA-CapabilityAddXDD-Mode-v1610 ::= SEQUENCE {

phyLayerParameters-v1610 PhyLayerParameters-v1610 OPTIONAL,

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

measParameters-v1610 MeasParameters-v1610 OPTIONAL,

eutra-5GC-Parameters-v1610 EUTRA-5GC-Parameters-v1610 OPTIONAL,

irat-ParametersNR-v1610 IRAT-ParametersNR-v1610 OPTIONAL,

neighCellSI-AcquisitionParameters-v1610 NeighCellSI-AcquisitionParameters-v1610 OPTIONAL,

mobilityParameters-v1610 MobilityParameters-v1610 OPTIONAL

}

UE-EUTRA-CapabilityAddXDD-Mode-v1630 ::= SEQUENCE {

measParameters-v1630 MeasParameters-v1630

}

AccessStratumRelease ::= ENUMERATED {

rel8, rel9, rel10, rel11, rel12, rel13,

rel14, rel15, ..., rel16, rel17}

FeatureSetsEUTRA-r15 ::= SEQUENCE {

featureSetsDL-r15 SEQUENCE (SIZE (1..maxFeatureSets-r15)) OF FeatureSetDL-r15 OPTIONAL,

featureSetsDL-PerCC-r15 SEQUENCE (SIZE (1..maxPerCC-FeatureSets-r15)) OF FeatureSetDL-PerCC-r15 OPTIONAL,

featureSetsUL-r15 SEQUENCE (SIZE (1..maxFeatureSets-r15)) OF FeatureSetUL-r15 OPTIONAL,

featureSetsUL-PerCC-r15 SEQUENCE (SIZE (1..maxPerCC-FeatureSets-r15)) OF FeatureSetUL-PerCC-r15 OPTIONAL,

...,

[[ featureSetsDL-v1550 SEQUENCE (SIZE (1..maxFeatureSets-r15)) OF FeatureSetDL-v1550 OPTIONAL

]]

}

MobilityParameters-r14 ::= SEQUENCE {

makeBeforeBreak-r14 ENUMERATED {supported} OPTIONAL,

rach-Less-r14 ENUMERATED {supported} OPTIONAL

}

MobilityParameters-v1610 ::= SEQUENCE {

cho-r16 ENUMERATED {supported} OPTIONAL,

cho-FDD-TDD-r16 ENUMERATED {supported} OPTIONAL,

cho-Failure-r16 ENUMERATED {supported} OPTIONAL,

cho-TwoTriggerEvents-r16 ENUMERATED {supported} OPTIONAL

}

DC-Parameters-r12 ::= SEQUENCE {

drb-TypeSplit-r12 ENUMERATED {supported} OPTIONAL,

drb-TypeSCG-r12 ENUMERATED {supported} OPTIONAL

}

DC-Parameters-v1310 ::= SEQUENCE {

pdcp-TransferSplitUL-r13 ENUMERATED {supported} OPTIONAL,

ue-SSTD-Meas-r13 ENUMERATED {supported} OPTIONAL

}

MAC-Parameters-r12 ::= SEQUENCE {

logicalChannelSR-ProhibitTimer-r12 ENUMERATED {supported} OPTIONAL,

longDRX-Command-r12 ENUMERATED {supported} OPTIONAL

}

MAC-Parameters-v1310 ::= SEQUENCE {

extendedMAC-LengthField-r13 ENUMERATED {supported} OPTIONAL,

extendedLongDRX-r13 ENUMERATED {supported} OPTIONAL

}

MAC-Parameters-v1430 ::= SEQUENCE {

shortSPS-IntervalFDD-r14 ENUMERATED {supported} OPTIONAL,

shortSPS-IntervalTDD-r14 ENUMERATED {supported} OPTIONAL,

skipUplinkDynamic-r14 ENUMERATED {supported} OPTIONAL,

skipUplinkSPS-r14 ENUMERATED {supported} OPTIONAL,

multipleUplinkSPS-r14 ENUMERATED {supported} OPTIONAL,

dataInactMon-r14 ENUMERATED {supported} OPTIONAL

}

MAC-Parameters-v1440 ::= SEQUENCE {

rai-Support-r14 ENUMERATED {supported} OPTIONAL

}

MAC-Parameters-v1530 ::= SEQUENCE {

min-Proc-TimelineSubslot-r15 SEQUENCE (SIZE(1..3)) OF ProcessingTimelineSet-r15 OPTIONAL,

skipSubframeProcessing-r15 SkipSubframeProcessing-r15 OPTIONAL,

earlyData-UP-r15 ENUMERATED {supported} OPTIONAL,

dormantSCellState-r15 ENUMERATED {supported} OPTIONAL,

directSCellActivation-r15 ENUMERATED {supported} OPTIONAL,

directSCellHibernation-r15 ENUMERATED {supported} OPTIONAL,

extendedLCID-Duplication-r15 ENUMERATED {supported} OPTIONAL,

sps-ServingCell-r15 ENUMERATED {supported} OPTIONAL

}

MAC-Parameters-v1550 ::= SEQUENCE {

eLCID-Support-r15 ENUMERATED {supported} OPTIONAL

}

MAC-Parameters-v1610 ::= SEQUENCE {

directMCG-SCellActivationResume-r16 ENUMERATED {supported} OPTIONAL,

directSCG-SCellActivationResume-r16 ENUMERATED {supported} OPTIONAL,

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

rai-SupportEnh-r16 ENUMERATED {supported} OPTIONAL

}

MAC-Parameters-v1630 ::= SEQUENCE {

directSCG-SCellActivationNEDC-r16 ENUMERATED {supported} OPTIONAL

}

NTN-Parameters-r17 ::= SEQUENCE {

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

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

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

ntn-OffsetTimingEnh-r17 ENUMERATED {supported} OPTIONAL,

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

}

ProcessingTimelineSet-r15 ::= ENUMERATED {set1, set2}

RLC-Parameters-r12 ::= SEQUENCE {

extended-RLC-LI-Field-r12 ENUMERATED {supported}

}

RLC-Parameters-v1310 ::= SEQUENCE {

extendedRLC-SN-SO-Field-r13 ENUMERATED {supported} OPTIONAL

}

RLC-Parameters-v1430 ::= SEQUENCE {

extendedPollByte-r14 ENUMERATED {supported} OPTIONAL

}

RLC-Parameters-v1530 ::= SEQUENCE {

flexibleUM-AM-Combinations-r15 ENUMERATED {supported} OPTIONAL,

rlc-AM-Ooo-Delivery-r15 ENUMERATED {supported} OPTIONAL,

rlc-UM-Ooo-Delivery-r15 ENUMERATED {supported} OPTIONAL

}

PDCP-Parameters ::= SEQUENCE {

supportedROHC-Profiles ROHC-ProfileSupportList-r15,

maxNumberROHC-ContextSessions ENUMERATED {

cs2, cs4, cs8, cs12, cs16, cs24, cs32,

cs48, cs64, cs128, cs256, cs512, cs1024,

cs16384, spare2, spare1} DEFAULT cs16,

...

}

PDCP-Parameters-v1130 ::= SEQUENCE {

pdcp-SN-Extension-r11 ENUMERATED {supported} OPTIONAL,

supportRohcContextContinue-r11 ENUMERATED {supported} OPTIONAL

}

PDCP-Parameters-v1310 ::= SEQUENCE {

pdcp-SN-Extension-18bits-r13 ENUMERATED {supported} OPTIONAL

}

PDCP-Parameters-v1430 ::= SEQUENCE {

supportedUplinkOnlyROHC-Profiles-r14 SEQUENCE {

profile0x0006-r14 BOOLEAN

},

maxNumberROHC-ContextSessions-r14 ENUMERATED {

cs2, cs4, cs8, cs12, cs16, cs24, cs32,

cs48, cs64, cs128, cs256, cs512, cs1024,

cs16384, spare2, spare1} DEFAULT cs16

}

PDCP-Parameters-v1530 ::= SEQUENCE {

supportedUDC-r15 SupportedUDC-r15 OPTIONAL,

pdcp-Duplication-r15 ENUMERATED {supported} OPTIONAL

}

PDCP-Parameters-v1610 ::= SEQUENCE {

pdcp-VersionChangeWithoutHO-r16 ENUMERATED {supported} OPTIONAL,

ehc-r16 ENUMERATED {supported} OPTIONAL,

continueEHC-Context-r16 ENUMERATED {supported} OPTIONAL,

maxNumberEHC-Contexts-r16 ENUMERATED {cs2, cs4, cs8, cs16, cs32, cs64, cs128, cs256,

cs512, cs1024, cs2048, cs4096, cs8192, cs16384,

cs32768, cs65536} OPTIONAL,

jointEHC-ROHC-Config-r16 ENUMERATED {supported} OPTIONAL

}

SupportedUDC-r15 ::= SEQUENCE {

supportedStandardDic-r15 ENUMERATED {supported} OPTIONAL,

supportedOperatorDic-r15 SupportedOperatorDic-r15 OPTIONAL

}

SupportedOperatorDic-r15 ::= SEQUENCE {

versionOfDictionary-r15 INTEGER (0..15),

associatedPLMN-ID-r15 PLMN-Identity

}

PhyLayerParameters ::= SEQUENCE {

ue-TxAntennaSelectionSupported BOOLEAN,

ue-SpecificRefSigsSupported BOOLEAN

}

PhyLayerParameters-v920 ::= SEQUENCE {

enhancedDualLayerFDD-r9 ENUMERATED {supported} OPTIONAL,

enhancedDualLayerTDD-r9 ENUMERATED {supported} OPTIONAL

}

PhyLayerParameters-v9d0 ::= SEQUENCE {

tm5-FDD-r9 ENUMERATED {supported} OPTIONAL,

tm5-TDD-r9 ENUMERATED {supported} OPTIONAL

}

PhyLayerParameters-v1020 ::= SEQUENCE {

twoAntennaPortsForPUCCH-r10 ENUMERATED {supported} OPTIONAL,

tm9-With-8Tx-FDD-r10 ENUMERATED {supported} OPTIONAL,

pmi-Disabling-r10 ENUMERATED {supported} OPTIONAL,

crossCarrierScheduling-r10 ENUMERATED {supported} OPTIONAL,

simultaneousPUCCH-PUSCH-r10 ENUMERATED {supported} OPTIONAL,

multiClusterPUSCH-WithinCC-r10 ENUMERATED {supported} OPTIONAL,

nonContiguousUL-RA-WithinCC-List-r10 NonContiguousUL-RA-WithinCC-List-r10 OPTIONAL

}

PhyLayerParameters-v1130 ::= SEQUENCE {

crs-InterfHandl-r11 ENUMERATED {supported} OPTIONAL,

ePDCCH-r11 ENUMERATED {supported} OPTIONAL,

multiACK-CSI-Reporting-r11 ENUMERATED {supported} OPTIONAL,

ss-CCH-InterfHandl-r11 ENUMERATED {supported} OPTIONAL,

tdd-SpecialSubframe-r11 ENUMERATED {supported} OPTIONAL,

txDiv-PUCCH1b-ChSelect-r11 ENUMERATED {supported} OPTIONAL,

ul-CoMP-r11 ENUMERATED {supported} OPTIONAL

}

PhyLayerParameters-v1170 ::= SEQUENCE {

interBandTDD-CA-WithDifferentConfig-r11 BIT STRING (SIZE (2)) OPTIONAL

}

PhyLayerParameters-v1250 ::= SEQUENCE {

e-HARQ-Pattern-FDD-r12 ENUMERATED {supported} OPTIONAL,

enhanced-4TxCodebook-r12 ENUMERATED {supported} OPTIONAL,

tdd-FDD-CA-PCellDuplex-r12 BIT STRING (SIZE (2)) OPTIONAL,

phy-TDD-ReConfig-TDD-PCell-r12 ENUMERATED {supported} OPTIONAL,

phy-TDD-ReConfig-FDD-PCell-r12 ENUMERATED {supported} OPTIONAL,

pusch-FeedbackMode-r12 ENUMERATED {supported} OPTIONAL,

pusch-SRS-PowerControl-SubframeSet-r12 ENUMERATED {supported} OPTIONAL,

csi-SubframeSet-r12 ENUMERATED {supported} OPTIONAL,

noResourceRestrictionForTTIBundling-r12 ENUMERATED {supported} OPTIONAL,

discoverySignalsInDeactSCell-r12 ENUMERATED {supported} OPTIONAL,

naics-Capability-List-r12 NAICS-Capability-List-r12 OPTIONAL

}

PhyLayerParameters-v1280 ::= SEQUENCE {

alternativeTBS-Indices-r12 ENUMERATED {supported} OPTIONAL

}

PhyLayerParameters-v1310 ::= SEQUENCE {

aperiodicCSI-Reporting-r13 BIT STRING (SIZE (2)) OPTIONAL,

codebook-HARQ-ACK-r13 BIT STRING (SIZE (2)) OPTIONAL,

crossCarrierScheduling-B5C-r13 ENUMERATED {supported} OPTIONAL,

fdd-HARQ-TimingTDD-r13 ENUMERATED {supported} OPTIONAL,

maxNumberUpdatedCSI-Proc-r13 INTEGER(5..32) OPTIONAL,

pucch-Format4-r13 ENUMERATED {supported} OPTIONAL,

pucch-Format5-r13 ENUMERATED {supported} OPTIONAL,

pucch-SCell-r13 ENUMERATED {supported} OPTIONAL,

spatialBundling-HARQ-ACK-r13 ENUMERATED {supported} OPTIONAL,

supportedBlindDecoding-r13 SEQUENCE {

maxNumberDecoding-r13 INTEGER(1..32) OPTIONAL,

pdcch-CandidateReductions-r13 ENUMERATED {supported} OPTIONAL,

skipMonitoringDCI-Format0-1A-r13 ENUMERATED {supported} OPTIONAL

} OPTIONAL,

uci-PUSCH-Ext-r13 ENUMERATED {supported} OPTIONAL,

crs-InterfMitigationTM10-r13 ENUMERATED {supported} OPTIONAL,

pdsch-CollisionHandling-r13 ENUMERATED {supported} OPTIONAL

}

PhyLayerParameters-v1320 ::= SEQUENCE {

mimo-UE-Parameters-r13 MIMO-UE-Parameters-r13 OPTIONAL

}

PhyLayerParameters-v1330 ::= SEQUENCE {

cch-InterfMitigation-RefRecTypeA-r13 ENUMERATED {supported} OPTIONAL,

cch-InterfMitigation-RefRecTypeB-r13 ENUMERATED {supported} OPTIONAL,

cch-InterfMitigation-MaxNumCCs-r13 INTEGER (1.. maxServCell-r13) OPTIONAL,

crs-InterfMitigationTM1toTM9-r13 INTEGER (1.. maxServCell-r13) OPTIONAL

}

PhyLayerParameters-v13e0 ::= SEQUENCE {

mimo-UE-Parameters-v13e0 MIMO-UE-Parameters-v13e0

}

PhyLayerParameters-v1430 ::= SEQUENCE {

ce-PUSCH-NB-MaxTBS-r14 ENUMERATED {supported} OPTIONAL,

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

ce-HARQ-AckBundling-r14 ENUMERATED {supported} OPTIONAL,

ce-PDSCH-TenProcesses-r14 ENUMERATED {supported} OPTIONAL,

ce-RetuningSymbols-r14 ENUMERATED {n0, n1} OPTIONAL,

ce-PDSCH-PUSCH-Enhancement-r14 ENUMERATED {supported} OPTIONAL,

ce-SchedulingEnhancement-r14 ENUMERATED {supported} OPTIONAL,

ce-SRS-Enhancement-r14 ENUMERATED {supported} OPTIONAL,

ce-PUCCH-Enhancement-r14 ENUMERATED {supported} OPTIONAL,

ce-ClosedLoopTxAntennaSelection-r14 ENUMERATED {supported} OPTIONAL,

tdd-SpecialSubframe-r14 ENUMERATED {supported} OPTIONAL,

tdd-TTI-Bundling-r14 ENUMERATED {supported} OPTIONAL,

dmrs-LessUpPTS-r14 ENUMERATED {supported} OPTIONAL,

mimo-UE-Parameters-v1430 MIMO-UE-Parameters-v1430 OPTIONAL,

alternativeTBS-Index-r14 ENUMERATED {supported} OPTIONAL,

feMBMS-Unicast-Parameters-r14 FeMBMS-Unicast-Parameters-r14 OPTIONAL

}

PhyLayerParameters-v1450 ::= SEQUENCE {

ce-SRS-EnhancementWithoutComb4-r14 ENUMERATED {supported} OPTIONAL,

crs-LessDwPTS-r14 ENUMERATED {supported} OPTIONAL}

PhyLayerParameters-v1470 ::= SEQUENCE {

mimo-UE-Parameters-v1470 MIMO-UE-Parameters-v1470 OPTIONAL,

srs-UpPTS-6sym-r14 ENUMERATED {supported} OPTIONAL

}

PhyLayerParameters-v14a0 ::= SEQUENCE {

ssp10-TDD-Only-r14 ENUMERATED {supported} OPTIONAL

}

PhyLayerParameters-v1530 ::= SEQUENCE {

stti-SPT-Capabilities-r15 SEQUENCE {

aperiodicCsi-ReportingSTTI-r15 ENUMERATED {supported} OPTIONAL,

dmrs-BasedSPDCCH-MBSFN-r15 ENUMERATED {supported} OPTIONAL,

dmrs-BasedSPDCCH-nonMBSFN-r15 ENUMERATED {supported} OPTIONAL,

dmrs-PositionPattern-r15 ENUMERATED {supported} OPTIONAL,

dmrs-SharingSubslotPDSCH-r15 ENUMERATED {supported} OPTIONAL,

dmrs-RepetitionSubslotPDSCH-r15 ENUMERATED {supported} OPTIONAL,

epdcch-SPT-differentCells-r15 ENUMERATED {supported} OPTIONAL,

epdcch-STTI-differentCells-r15 ENUMERATED {supported} OPTIONAL,

maxLayersSlotOrSubslotPUSCH-r15 ENUMERATED {oneLayer,twoLayers,fourLayers}

OPTIONAL,

maxNumberUpdatedCSI-Proc-SPT-r15 INTEGER(5..32) OPTIONAL,

maxNumberUpdatedCSI-Proc-STTI-Comb77-r15 INTEGER(1..32) OPTIONAL,

maxNumberUpdatedCSI-Proc-STTI-Comb27-r15 INTEGER(1..32) OPTIONAL,

maxNumberUpdatedCSI-Proc-STTI-Comb22-Set1-r15 INTEGER(1..32) OPTIONAL,

maxNumberUpdatedCSI-Proc-STTI-Comb22-Set2-r15 INTEGER(1..32) OPTIONAL,

mimo-UE-ParametersSTTI-r15 MIMO-UE-Parameters-r13 OPTIONAL,

mimo-UE-ParametersSTTI-v1530 MIMO-UE-Parameters-v1430 OPTIONAL,

numberOfBlindDecodesUSS-r15 INTEGER(4..32) OPTIONAL,

pdsch-SlotSubslotPDSCH-Decoding-r15 ENUMERATED {supported} OPTIONAL,

powerUCI-SlotPUSCH ENUMERATED {supported} OPTIONAL,

powerUCI-SubslotPUSCH ENUMERATED {supported} OPTIONAL,

slotPDSCH-TxDiv-TM9and10 ENUMERATED {supported} OPTIONAL,

subslotPDSCH-TxDiv-TM9and10 ENUMERATED {supported} OPTIONAL,

spdcch-differentRS-types-r15 ENUMERATED {supported} OPTIONAL,

srs-DCI7-TriggeringFS2-r15 ENUMERATED {supported} OPTIONAL,

sps-cyclicShift-r15 ENUMERATED {supported} OPTIONAL,

spdcch-Reuse-r15 ENUMERATED {supported} OPTIONAL,

sps-STTI-r15 ENUMERATED {slot, subslot, slotAndSubslot}

OPTIONAL,

tm8-slotPDSCH-r15 ENUMERATED {supported} OPTIONAL,

tm9-slotSubslot-r15 ENUMERATED {supported} OPTIONAL,

tm9-slotSubslotMBSFN-r15 ENUMERATED {supported} OPTIONAL,

tm10-slotSubslot-r15 ENUMERATED {supported} OPTIONAL,

tm10-slotSubslotMBSFN-r15 ENUMERATED {supported} OPTIONAL,

txDiv-SPUCCH-r15 ENUMERATED {supported} OPTIONAL,

ul-AsyncHarqSharingDiff-TTI-Lengths-r15 ENUMERATED {supported} OPTIONAL

} OPTIONAL,

ce-Capabilities-r15 SEQUENCE {

ce-CRS-IntfMitig-r15 ENUMERATED {supported} OPTIONAL,

ce-CQI-AlternativeTable-r15 ENUMERATED {supported} OPTIONAL,

ce-PDSCH-FlexibleStartPRB-CE-ModeA-r15 ENUMERATED {supported} OPTIONAL,

ce-PDSCH-FlexibleStartPRB-CE-ModeB-r15 ENUMERATED {supported} OPTIONAL,

ce-PDSCH-64QAM-r15 ENUMERATED {supported} OPTIONAL,

ce-PUSCH-FlexibleStartPRB-CE-ModeA-r15 ENUMERATED {supported} OPTIONAL,

ce-PUSCH-FlexibleStartPRB-CE-ModeB-r15 ENUMERATED {supported} OPTIONAL,

ce-PUSCH-SubPRB-Allocation-r15 ENUMERATED {supported} OPTIONAL,

ce-UL-HARQ-ACK-Feedback-r15 ENUMERATED {supported} OPTIONAL

} OPTIONAL,

shortCQI-ForSCellActivation-r15 ENUMERATED {supported} OPTIONAL,

mimo-CBSR-AdvancedCSI-r15 ENUMERATED {supported} OPTIONAL,

crs-IntfMitig-r15 ENUMERATED {supported} OPTIONAL,

ul-PowerControlEnhancements-r15 ENUMERATED {supported} OPTIONAL,

urllc-Capabilities-r15 SEQUENCE {

pdsch-RepSubframe-r15 ENUMERATED {supported} OPTIONAL,

pdsch-RepSlot-r15 ENUMERATED {supported} OPTIONAL,

pdsch-RepSubslot-r15 ENUMERATED {supported} OPTIONAL,

pusch-SPS-MultiConfigSubframe-r15 INTEGER (0..6) OPTIONAL,

pusch-SPS-MaxConfigSubframe-r15 INTEGER (0..31) OPTIONAL,

pusch-SPS-MultiConfigSlot-r15 INTEGER (0..6) OPTIONAL,

pusch-SPS-MaxConfigSlot-r15 INTEGER (0..31) OPTIONAL,

pusch-SPS-MultiConfigSubslot-r15 INTEGER (0..6) OPTIONAL,

pusch-SPS-MaxConfigSubslot-r15 INTEGER (0..31) OPTIONAL,

pusch-SPS-SlotRepPCell-r15 ENUMERATED {supported} OPTIONAL,

pusch-SPS-SlotRepPSCell-r15 ENUMERATED {supported} OPTIONAL,

pusch-SPS-SlotRepSCell-r15 ENUMERATED {supported} OPTIONAL,

pusch-SPS-SubframeRepPCell-r15 ENUMERATED {supported} OPTIONAL,

pusch-SPS-SubframeRepPSCell-r15 ENUMERATED {supported} OPTIONAL,

pusch-SPS-SubframeRepSCell-r15 ENUMERATED {supported} OPTIONAL,

pusch-SPS-SubslotRepPCell-r15 ENUMERATED {supported} OPTIONAL,

pusch-SPS-SubslotRepPSCell-r15 ENUMERATED {supported} OPTIONAL,

pusch-SPS-SubslotRepSCell-r15 ENUMERATED {supported} OPTIONAL,

semiStaticCFI-r15 ENUMERATED {supported} OPTIONAL,

semiStaticCFI-Pattern-r15 ENUMERATED {supported} OPTIONAL

} OPTIONAL,

altMCS-Table-r15 ENUMERATED {supported} OPTIONAL

}

PhyLayerParameters-v1540 ::= SEQUENCE {

stti-SPT-Capabilities-v1540 SEQUENCE {

slotPDSCH-TxDiv-TM8-r15 ENUMERATED {supported}

} OPTIONAL,

crs-IM-TM1-toTM9-OneRX-Port-v1540 ENUMERATED {supported} OPTIONAL,

cch-IM-RefRecTypeA-OneRX-Port-v1540 ENUMERATED {supported} OPTIONAL

}

PhyLayerParameters-v1550 ::= SEQUENCE {

dmrs-OverheadReduction-r15 ENUMERATED {supported} OPTIONAL

}

PhyLayerParameters-v1610 ::= SEQUENCE {

ce-Capabilities-v1610 SEQUENCE {

ce-CSI-RS-Feedback-r16 ENUMERATED {supported} OPTIONAL,

ce-CSI-RS-FeedbackCodebookRestriction-r16 ENUMERATED {supported} OPTIONAL,

crs-ChEstMPDCCH-CE-ModeA-r16 ENUMERATED {supported} OPTIONAL,

crs-ChEstMPDCCH-CE-ModeB-r16 ENUMERATED {supported} OPTIONAL,

crs-ChEstMPDCCH-CSI-r16 ENUMERATED {supported} OPTIONAL,

crs-ChEstMPDCCH-ReciprocityTDD-r16 ENUMERATED {supported} OPTIONAL,

etws-CMAS-RxInConnCE-ModeA-r16 ENUMERATED {supported} OPTIONAL,

etws-CMAS-RxInConnCE-ModeB-r16 ENUMERATED {supported} OPTIONAL,

mpdcch-InLteControlRegionCE-ModeA-r16 ENUMERATED {supported} OPTIONAL,

mpdcch-InLteControlRegionCE-ModeB-r16 ENUMERATED {supported} OPTIONAL,

pdsch-InLteControlRegionCE-ModeA-r16 ENUMERATED {supported} OPTIONAL,

pdsch-InLteControlRegionCE-ModeB-r16 ENUMERATED {supported} OPTIONAL,

multiTB-Parameters-r16 CE-MultiTB-Parameters-r16 OPTIONAL,

resourceResvParameters-r16 CE-ResourceResvParameters-r16 OPTIONAL

} OPTIONAL,

widebandPRG-Slot-r16 ENUMERATED {supported} OPTIONAL,

widebandPRG-Subslot-r16 ENUMERATED {supported} OPTIONAL,

widebandPRG-Subframe-r16 ENUMERATED {supported} OPTIONAL,

addSRS-r16 SEQUENCE {

addSRS-FrequencyHopping-r16 ENUMERATED {supported} OPTIONAL,

addSRS-AntennaSwitching-r16 ENUMERATED {useBasic} OPTIONAL,

addSRS-CarrierSwitching-r16 ENUMERATED {supported} OPTIONAL

} OPTIONAL,

virtualCellID-BasicSRS-r16 ENUMERATED {supported} OPTIONAL,

virtualCellID-AddSRS-r16 ENUMERATED {supported} OPTIONAL

}

PhyLayerParameters-v1700 ::= SEQUENCE {

ce-Capabilities-v1700 SEQUENCE {

ce-PDSCH-14HARQProcesses-r17 ENUMERATED {supported} OPTIONAL,

ce-PDSCH-14HARQProcesses-Alt2-r17 ENUMERATED {supported} OPTIONAL,

ce-PDSCH-MaxTBS-r17 ENUMERATED {supported} OPTIONAL

} OPTIONAL

}

MIMO-UE-Parameters-r13 ::= SEQUENCE {

parametersTM9-r13 MIMO-UE-ParametersPerTM-r13 OPTIONAL,

parametersTM10-r13 MIMO-UE-ParametersPerTM-r13 OPTIONAL,

srs-EnhancementsTDD-r13 ENUMERATED {supported} OPTIONAL,

srs-Enhancements-r13 ENUMERATED {supported} OPTIONAL,

interferenceMeasRestriction-r13 ENUMERATED {supported} OPTIONAL

}

MIMO-UE-Parameters-v13e0 ::= SEQUENCE {

mimo-WeightedLayersCapabilities-r13 MIMO-WeightedLayersCapabilities-r13 OPTIONAL

}

MIMO-UE-Parameters-v1430 ::= SEQUENCE {

parametersTM9-v1430 MIMO-UE-ParametersPerTM-v1430 OPTIONAL,

parametersTM10-v1430 MIMO-UE-ParametersPerTM-v1430 OPTIONAL

}

MIMO-UE-Parameters-v1470 ::= SEQUENCE {

parametersTM9-v1470 MIMO-UE-ParametersPerTM-v1470,

parametersTM10-v1470 MIMO-UE-ParametersPerTM-v1470

}

MIMO-UE-ParametersPerTM-r13 ::= SEQUENCE {

nonPrecoded-r13 MIMO-NonPrecodedCapabilities-r13 OPTIONAL,

beamformed-r13 MIMO-UE-BeamformedCapabilities-r13 OPTIONAL,

channelMeasRestriction-r13 ENUMERATED {supported} OPTIONAL,

dmrs-Enhancements-r13 ENUMERATED {supported} OPTIONAL,

csi-RS-EnhancementsTDD-r13 ENUMERATED {supported} OPTIONAL

}

MIMO-UE-ParametersPerTM-v1430 ::= SEQUENCE {

nzp-CSI-RS-AperiodicInfo-r14 SEQUENCE {

nMaxProc-r14 INTEGER(5..32),

nMaxResource-r14 ENUMERATED {n1, n2, n4, n8}

} OPTIONAL,

nzp-CSI-RS-PeriodicInfo-r14 SEQUENCE {

nMaxResource-r14 ENUMERATED {n1, n2, n4, n8}

} OPTIONAL,

zp-CSI-RS-AperiodicInfo-r14 ENUMERATED {supported} OPTIONAL,

ul-dmrs-Enhancements-r14 ENUMERATED {supported} OPTIONAL,

densityReductionNP-r14 ENUMERATED {supported} OPTIONAL,

densityReductionBF-r14 ENUMERATED {supported} OPTIONAL,

hybridCSI-r14 ENUMERATED {supported} OPTIONAL,

semiOL-r14 ENUMERATED {supported} OPTIONAL,

csi-ReportingNP-r14 ENUMERATED {supported} OPTIONAL,

csi-ReportingAdvanced-r14 ENUMERATED {supported} OPTIONAL

}

MIMO-UE-ParametersPerTM-v1470 ::= SEQUENCE {

csi-ReportingAdvancedMaxPorts-r14 ENUMERATED {n8, n12, n16, n20, n24, n28} OPTIONAL

}

MIMO-CA-ParametersPerBoBC-r13 ::= SEQUENCE {

parametersTM9-r13 MIMO-CA-ParametersPerBoBCPerTM-r13 OPTIONAL,

parametersTM10-r13 MIMO-CA-ParametersPerBoBCPerTM-r13 OPTIONAL

}

MIMO-CA-ParametersPerBoBC-r15 ::= SEQUENCE {

parametersTM9-r15 MIMO-CA-ParametersPerBoBCPerTM-r15 OPTIONAL,

parametersTM10-r15 MIMO-CA-ParametersPerBoBCPerTM-r15 OPTIONAL

}

MIMO-CA-ParametersPerBoBC-v1430 ::= SEQUENCE {

parametersTM9-v1430 MIMO-CA-ParametersPerBoBCPerTM-v1430 OPTIONAL,

parametersTM10-v1430 MIMO-CA-ParametersPerBoBCPerTM-v1430 OPTIONAL

}

MIMO-CA-ParametersPerBoBC-v1470 ::= SEQUENCE {

parametersTM9-v1470 MIMO-CA-ParametersPerBoBCPerTM-v1470,

parametersTM10-v1470 MIMO-CA-ParametersPerBoBCPerTM-v1470

}

MIMO-CA-ParametersPerBoBCPerTM-r13 ::= SEQUENCE {

nonPrecoded-r13 MIMO-NonPrecodedCapabilities-r13 OPTIONAL,

beamformed-r13 MIMO-BeamformedCapabilityList-r13 OPTIONAL,

dmrs-Enhancements-r13 ENUMERATED {different} OPTIONAL

}

MIMO-CA-ParametersPerBoBCPerTM-v1430 ::= SEQUENCE {

csi-ReportingNP-r14 ENUMERATED {different} OPTIONAL,

csi-ReportingAdvanced-r14 ENUMERATED {different} OPTIONAL

}

MIMO-CA-ParametersPerBoBCPerTM-v1470 ::= SEQUENCE {

csi-ReportingAdvancedMaxPorts-r14 ENUMERATED {n8, n12, n16, n20, n24, n28} OPTIONAL

}

MIMO-CA-ParametersPerBoBCPerTM-r15 ::= SEQUENCE {

nonPrecoded-r13 MIMO-NonPrecodedCapabilities-r13 OPTIONAL,

beamformed-r13 MIMO-BeamformedCapabilityList-r13 OPTIONAL,

dmrs-Enhancements-r13 ENUMERATED {different} OPTIONAL,

csi-ReportingNP-r14 ENUMERATED {different} OPTIONAL,

csi-ReportingAdvanced-r14 ENUMERATED {different} OPTIONAL

}

MIMO-NonPrecodedCapabilities-r13 ::= SEQUENCE {

config1-r13 ENUMERATED {supported} OPTIONAL,

config2-r13 ENUMERATED {supported} OPTIONAL,

config3-r13 ENUMERATED {supported} OPTIONAL,

config4-r13 ENUMERATED {supported} OPTIONAL

}

MIMO-UE-BeamformedCapabilities-r13 ::= SEQUENCE {

altCodebook-r13 ENUMERATED {supported} OPTIONAL,

mimo-BeamformedCapabilities-r13 MIMO-BeamformedCapabilityList-r13

}

MIMO-BeamformedCapabilityList-r13 ::= SEQUENCE (SIZE (1..maxCSI-Proc-r11)) OF MIMO-BeamformedCapabilities-r13

MIMO-BeamformedCapabilities-r13 ::= SEQUENCE {

k-Max-r13 INTEGER (1..8),

n-MaxList-r13 BIT STRING (SIZE (1..7)) OPTIONAL

}

MIMO-WeightedLayersCapabilities-r13 ::= SEQUENCE {

relWeightTwoLayers-r13 ENUMERATED {v1, v1dot25, v1dot5, v1dot75, v2, v2dot5, v3, v4},

relWeightFourLayers-r13 ENUMERATED {v1, v1dot25, v1dot5, v1dot75, v2, v2dot5, v3, v4} OPTIONAL,

relWeightEightLayers-r13 ENUMERATED {v1, v1dot25, v1dot5, v1dot75, v2, v2dot5, v3, v4} OPTIONAL,

totalWeightedLayers-r13 INTEGER (2..128)

}

NonContiguousUL-RA-WithinCC-List-r10 ::= SEQUENCE (SIZE (1..maxBands)) OF NonContiguousUL-RA-WithinCC-r10

NonContiguousUL-RA-WithinCC-r10 ::= SEQUENCE {

nonContiguousUL-RA-WithinCC-Info-r10 ENUMERATED {supported} OPTIONAL

}

RF-Parameters ::= SEQUENCE {

supportedBandListEUTRA SupportedBandListEUTRA

}

RF-Parameters-v9e0 ::= SEQUENCE {

supportedBandListEUTRA-v9e0 SupportedBandListEUTRA-v9e0 OPTIONAL

}

RF-Parameters-v1020 ::= SEQUENCE {

supportedBandCombination-r10 SupportedBandCombination-r10

}

RF-Parameters-v1060 ::= SEQUENCE {

supportedBandCombinationExt-r10 SupportedBandCombinationExt-r10

}

RF-Parameters-v1090 ::= SEQUENCE {

supportedBandCombination-v1090 SupportedBandCombination-v1090 OPTIONAL

}

RF-Parameters-v10f0 ::= SEQUENCE {

modifiedMPR-Behavior-r10 BIT STRING (SIZE (32)) OPTIONAL

}

RF-Parameters-v10i0 ::= SEQUENCE {

supportedBandCombination-v10i0 SupportedBandCombination-v10i0 OPTIONAL

}

RF-Parameters-v10j0 ::= SEQUENCE {

multiNS-Pmax-r10 ENUMERATED {supported} OPTIONAL

}

RF-Parameters-v1130 ::= SEQUENCE {

supportedBandCombination-v1130 SupportedBandCombination-v1130 OPTIONAL

}

RF-Parameters-v1180 ::= SEQUENCE {

freqBandRetrieval-r11 ENUMERATED {supported} OPTIONAL,

requestedBands-r11 SEQUENCE (SIZE (1.. maxBands)) OF FreqBandIndicator-r11 OPTIONAL,

supportedBandCombinationAdd-r11 SupportedBandCombinationAdd-r11 OPTIONAL

}

RF-Parameters-v11d0 ::= SEQUENCE {

supportedBandCombinationAdd-v11d0 SupportedBandCombinationAdd-v11d0 OPTIONAL

}

RF-Parameters-v1250 ::= SEQUENCE {

supportedBandListEUTRA-v1250 SupportedBandListEUTRA-v1250 OPTIONAL,

supportedBandCombination-v1250 SupportedBandCombination-v1250 OPTIONAL,

supportedBandCombinationAdd-v1250 SupportedBandCombinationAdd-v1250 OPTIONAL,

freqBandPriorityAdjustment-r12 ENUMERATED {supported} OPTIONAL

}

RF-Parameters-v1270 ::= SEQUENCE {

supportedBandCombination-v1270 SupportedBandCombination-v1270 OPTIONAL,

supportedBandCombinationAdd-v1270 SupportedBandCombinationAdd-v1270 OPTIONAL

}

RF-Parameters-v1310 ::= SEQUENCE {

eNB-RequestedParameters-r13 SEQUENCE {

reducedIntNonContCombRequested-r13 ENUMERATED {true} OPTIONAL,

requestedCCsDL-r13 INTEGER (2..32) OPTIONAL,

requestedCCsUL-r13 INTEGER (2..32) OPTIONAL,

skipFallbackCombRequested-r13 ENUMERATED {true} OPTIONAL

} OPTIONAL,

maximumCCsRetrieval-r13 ENUMERATED {supported} OPTIONAL,

skipFallbackCombinations-r13 ENUMERATED {supported} OPTIONAL,

reducedIntNonContComb-r13 ENUMERATED {supported} OPTIONAL,

supportedBandListEUTRA-v1310 SupportedBandListEUTRA-v1310 OPTIONAL,

supportedBandCombinationReduced-r13 SupportedBandCombinationReduced-r13 OPTIONAL

}

RF-Parameters-v1320 ::= SEQUENCE {

supportedBandListEUTRA-v1320 SupportedBandListEUTRA-v1320 OPTIONAL,

supportedBandCombination-v1320 SupportedBandCombination-v1320 OPTIONAL,

supportedBandCombinationAdd-v1320 SupportedBandCombinationAdd-v1320 OPTIONAL,

supportedBandCombinationReduced-v1320 SupportedBandCombinationReduced-v1320 OPTIONAL

}

RF-Parameters-v1380 ::= SEQUENCE {

supportedBandCombination-v1380 SupportedBandCombination-v1380 OPTIONAL,

supportedBandCombinationAdd-v1380 SupportedBandCombinationAdd-v1380 OPTIONAL,

supportedBandCombinationReduced-v1380 SupportedBandCombinationReduced-v1380 OPTIONAL

}

RF-Parameters-v1390 ::= SEQUENCE {

supportedBandCombination-v1390 SupportedBandCombination-v1390 OPTIONAL,

supportedBandCombinationAdd-v1390 SupportedBandCombinationAdd-v1390 OPTIONAL,

supportedBandCombinationReduced-v1390 SupportedBandCombinationReduced-v1390 OPTIONAL

}

RF-Parameters-v12b0 ::= SEQUENCE {

maxLayersMIMO-Indication-r12 ENUMERATED {supported} OPTIONAL

}

RF-Parameters-v1430 ::= SEQUENCE {

supportedBandCombination-v1430 SupportedBandCombination-v1430 OPTIONAL,

supportedBandCombinationAdd-v1430 SupportedBandCombinationAdd-v1430 OPTIONAL,

supportedBandCombinationReduced-v1430 SupportedBandCombinationReduced-v1430 OPTIONAL,

eNB-RequestedParameters-v1430 SEQUENCE {

requestedDiffFallbackCombList-r14 BandCombinationList-r14

} OPTIONAL,

diffFallbackCombReport-r14 ENUMERATED {supported} OPTIONAL

}

RF-Parameters-v1450 ::= SEQUENCE {

supportedBandCombination-v1450 SupportedBandCombination-v1450 OPTIONAL,

supportedBandCombinationAdd-v1450 SupportedBandCombinationAdd-v1450 OPTIONAL,

supportedBandCombinationReduced-v1450 SupportedBandCombinationReduced-v1450 OPTIONAL

}

RF-Parameters-v1470 ::= SEQUENCE {

supportedBandCombination-v1470 SupportedBandCombination-v1470 OPTIONAL,

supportedBandCombinationAdd-v1470 SupportedBandCombinationAdd-v1470 OPTIONAL,

supportedBandCombinationReduced-v1470 SupportedBandCombinationReduced-v1470 OPTIONAL

}

RF-Parameters-v14b0 ::= SEQUENCE {

supportedBandCombination-v14b0 SupportedBandCombination-v14b0 OPTIONAL,

supportedBandCombinationAdd-v14b0 SupportedBandCombinationAdd-v14b0 OPTIONAL,

supportedBandCombinationReduced-v14b0 SupportedBandCombinationReduced-v14b0 OPTIONAL

}

RF-Parameters-v1530 ::= SEQUENCE {

sTTI-SPT-Supported-r15 ENUMERATED {supported} OPTIONAL,

supportedBandCombination-v1530 SupportedBandCombination-v1530 OPTIONAL,

supportedBandCombinationAdd-v1530 SupportedBandCombinationAdd-v1530 OPTIONAL,

supportedBandCombinationReduced-v1530 SupportedBandCombinationReduced-v1530 OPTIONAL,

powerClass-14dBm-r15 ENUMERATED {supported} OPTIONAL

}

RF-Parameters-v1570 ::= SEQUENCE {

dl-1024QAM-ScalingFactor-r15 ENUMERATED {v1, v1dot2, v1dot25},

dl-1024QAM-TotalWeightedLayers-r15 INTEGER (0..10)

}

RF-Parameters-v1610 ::= SEQUENCE {

supportedBandCombination-v1610 SupportedBandCombination-v1610 OPTIONAL,

supportedBandCombinationAdd-v1610 SupportedBandCombinationAdd-v1610 OPTIONAL,

supportedBandCombinationReduced-v1610 SupportedBandCombinationReduced-v1610 OPTIONAL

}

RF-Parameters-v1630 ::= SEQUENCE {

supportedBandCombination-v1630 SupportedBandCombination-v1630 OPTIONAL,

supportedBandCombinationAdd-v1630 SupportedBandCombinationAdd-v1630 OPTIONAL,

supportedBandCombinationReduced-v1630 SupportedBandCombinationReduced-v1630 OPTIONAL

}

SkipSubframeProcessing-r15 ::= SEQUENCE {

skipProcessingDL-Slot-r15 INTEGER (0..3) OPTIONAL,

skipProcessingDL-SubSlot-r15 INTEGER (0..3) OPTIONAL,

skipProcessingUL-Slot-r15 INTEGER (0..3) OPTIONAL,

skipProcessingUL-SubSlot-r15 INTEGER (0..3) OPTIONAL

}

SPT-Parameters-r15 ::= SEQUENCE {

frameStructureType-SPT-r15 BIT STRING (SIZE (3)) OPTIONAL,

maxNumberCCs-SPT-r15 INTEGER (1..32) OPTIONAL

}

STTI-SPT-BandParameters-r15 ::= SEQUENCE {

dl-1024QAM-Slot-r15 ENUMERATED {supported} OPTIONAL,

dl-1024QAM-SubslotTA-1-r15 ENUMERATED {supported} OPTIONAL,

dl-1024QAM-SubslotTA-2-r15 ENUMERATED {supported} OPTIONAL,

simultaneousTx-differentTx-duration-r15 ENUMERATED {supported} OPTIONAL,

sTTI-CA-MIMO-ParametersDL-r15 CA-MIMO-ParametersDL-r15 OPTIONAL,

sTTI-CA-MIMO-ParametersUL-r15 CA-MIMO-ParametersUL-r15,

sTTI-FD-MIMO-Coexistence ENUMERATED {supported} OPTIONAL,

sTTI-MIMO-CA-ParametersPerBoBCs-r15 MIMO-CA-ParametersPerBoBC-r13 OPTIONAL,

sTTI-MIMO-CA-ParametersPerBoBCs-v1530 MIMO-CA-ParametersPerBoBC-v1430 OPTIONAL,

sTTI-SupportedCombinations-r15 STTI-SupportedCombinations-r15 OPTIONAL,

sTTI-SupportedCSI-Proc-r15 ENUMERATED {n1, n3, n4} OPTIONAL,

ul-256QAM-Slot-r15 ENUMERATED {supported} OPTIONAL,

ul-256QAM-Subslot-r15 ENUMERATED {supported} OPTIONAL,

...

}

STTI-SupportedCombinations-r15 ::= SEQUENCE {

combination-22-r15 DL-UL-CCs-r15 OPTIONAL,

combination-77-r15 DL-UL-CCs-r15 OPTIONAL,

combination-27-r15 DL-UL-CCs-r15 OPTIONAL,

combination-22-27-r15 SEQUENCE (SIZE (1..2)) OF DL-UL-CCs-r15 OPTIONAL,

combination-77-22-r15 SEQUENCE (SIZE (1..2)) OF DL-UL-CCs-r15 OPTIONAL,

combination-77-27-r15 SEQUENCE (SIZE (1..2)) OF DL-UL-CCs-r15 OPTIONAL

}

DL-UL-CCs-r15 ::= SEQUENCE {

maxNumberDL-CCs-r15 INTEGER (1..32) OPTIONAL,

maxNumberUL-CCs-r15 INTEGER (1..32) OPTIONAL

}

SupportedBandCombination-r10 ::= SEQUENCE (SIZE (1..maxBandComb-r10)) OF BandCombinationParameters-r10

SupportedBandCombinationExt-r10 ::= SEQUENCE (SIZE (1..maxBandComb-r10)) OF BandCombinationParametersExt-r10

SupportedBandCombination-v1090 ::= SEQUENCE (SIZE (1..maxBandComb-r10)) OF BandCombinationParameters-v1090

SupportedBandCombination-v10i0 ::= SEQUENCE (SIZE (1..maxBandComb-r10)) OF BandCombinationParameters-v10i0

SupportedBandCombination-v1130 ::= SEQUENCE (SIZE (1..maxBandComb-r10)) OF BandCombinationParameters-v1130

SupportedBandCombination-v1250 ::= SEQUENCE (SIZE (1..maxBandComb-r10)) OF BandCombinationParameters-v1250

SupportedBandCombination-v1270 ::= SEQUENCE (SIZE (1..maxBandComb-r10)) OF BandCombinationParameters-v1270

SupportedBandCombination-v1320 ::= SEQUENCE (SIZE (1..maxBandComb-r10)) OF BandCombinationParameters-v1320

SupportedBandCombination-v1380 ::= SEQUENCE (SIZE (1..maxBandComb-r10)) OF BandCombinationParameters-v1380

SupportedBandCombination-v1390 ::= SEQUENCE (SIZE (1..maxBandComb-r10)) OF BandCombinationParameters-v1390

SupportedBandCombination-v1430 ::= SEQUENCE (SIZE (1..maxBandComb-r10)) OF BandCombinationParameters-v1430

SupportedBandCombination-v1450 ::= SEQUENCE (SIZE (1..maxBandComb-r10)) OF BandCombinationParameters-v1450

SupportedBandCombination-v1470 ::= SEQUENCE (SIZE (1..maxBandComb-r10)) OF BandCombinationParameters-v1470

SupportedBandCombination-v14b0 ::= SEQUENCE (SIZE (1..maxBandComb-r10)) OF BandCombinationParameters-v14b0

SupportedBandCombination-v1530 ::= SEQUENCE (SIZE (1..maxBandComb-r10)) OF BandCombinationParameters-v1530

SupportedBandCombination-v1610 ::= SEQUENCE (SIZE (1..maxBandComb-r10)) OF BandCombinationParameters-v1610

SupportedBandCombination-v1630 ::= SEQUENCE (SIZE (1..maxBandComb-r10)) OF BandCombinationParameters-v1630

SupportedBandCombinationAdd-r11 ::= SEQUENCE (SIZE (1..maxBandComb-r11)) OF BandCombinationParameters-r11

SupportedBandCombinationAdd-v11d0 ::= SEQUENCE (SIZE (1..maxBandComb-r11)) OF BandCombinationParameters-v10i0

SupportedBandCombinationAdd-v1250 ::= SEQUENCE (SIZE (1..maxBandComb-r11)) OF BandCombinationParameters-v1250

SupportedBandCombinationAdd-v1270 ::= SEQUENCE (SIZE (1..maxBandComb-r11)) OF BandCombinationParameters-v1270

SupportedBandCombinationAdd-v1320 ::= SEQUENCE (SIZE (1..maxBandComb-r11)) OF BandCombinationParameters-v1320

SupportedBandCombinationAdd-v1380 ::= SEQUENCE (SIZE (1..maxBandComb-r11)) OF BandCombinationParameters-v1380

SupportedBandCombinationAdd-v1390 ::= SEQUENCE (SIZE (1..maxBandComb-r11)) OF BandCombinationParameters-v1390

SupportedBandCombinationAdd-v1430 ::= SEQUENCE (SIZE (1..maxBandComb-r11)) OF BandCombinationParameters-v1430

SupportedBandCombinationAdd-v1450 ::= SEQUENCE (SIZE (1..maxBandComb-r11)) OF BandCombinationParameters-v1450

SupportedBandCombinationAdd-v1470 ::= SEQUENCE (SIZE (1..maxBandComb-r11)) OF BandCombinationParameters-v1470

SupportedBandCombinationAdd-v14b0 ::= SEQUENCE (SIZE (1..maxBandComb-r11)) OF BandCombinationParameters-v14b0

SupportedBandCombinationAdd-v1530 ::= SEQUENCE (SIZE (1..maxBandComb-r11)) OF BandCombinationParameters-v1530

SupportedBandCombinationAdd-v1610 ::= SEQUENCE (SIZE (1..maxBandComb-r11)) OF BandCombinationParameters-v1610

SupportedBandCombinationAdd-v1630 ::= SEQUENCE (SIZE (1..maxBandComb-r11)) OF BandCombinationParameters-v1630

SupportedBandCombinationReduced-r13 ::= SEQUENCE (SIZE (1..maxBandComb-r13)) OF BandCombinationParameters-r13

SupportedBandCombinationReduced-v1320 ::= SEQUENCE (SIZE (1..maxBandComb-r13)) OF BandCombinationParameters-v1320

SupportedBandCombinationReduced-v1380 ::= SEQUENCE (SIZE (1..maxBandComb-r13)) OF BandCombinationParameters-v1380

SupportedBandCombinationReduced-v1390 ::= SEQUENCE (SIZE (1..maxBandComb-r13)) OF BandCombinationParameters-v1390

SupportedBandCombinationReduced-v1430 ::= SEQUENCE (SIZE (1..maxBandComb-r13)) OF BandCombinationParameters-v1430

SupportedBandCombinationReduced-v1450 ::= SEQUENCE (SIZE (1..maxBandComb-r13)) OF BandCombinationParameters-v1450

SupportedBandCombinationReduced-v1470 ::= SEQUENCE (SIZE (1..maxBandComb-r13)) OF BandCombinationParameters-v1470

SupportedBandCombinationReduced-v14b0 ::= SEQUENCE (SIZE (1..maxBandComb-r13)) OF BandCombinationParameters-v14b0

SupportedBandCombinationReduced-v1530 ::= SEQUENCE (SIZE (1..maxBandComb-r13)) OF BandCombinationParameters-v1530

SupportedBandCombinationReduced-v1610 ::= SEQUENCE (SIZE (1..maxBandComb-r13)) OF BandCombinationParameters-v1610

SupportedBandCombinationReduced-v1630 ::= SEQUENCE (SIZE (1..maxBandComb-r13)) OF BandCombinationParameters-v1630

BandCombinationParameters-r10 ::= SEQUENCE (SIZE (1..maxSimultaneousBands-r10)) OF BandParameters-r10

BandCombinationParametersExt-r10 ::= SEQUENCE {

supportedBandwidthCombinationSet-r10 SupportedBandwidthCombinationSet-r10 OPTIONAL

}

BandCombinationParameters-v1090 ::= SEQUENCE (SIZE (1..maxSimultaneousBands-r10)) OF BandParameters-v1090

BandCombinationParameters-v10i0::= SEQUENCE {

bandParameterList-v10i0 SEQUENCE (SIZE (1..maxSimultaneousBands-r10)) OF

BandParameters-v10i0 OPTIONAL

}

BandCombinationParameters-v1130 ::= SEQUENCE {

multipleTimingAdvance-r11 ENUMERATED {supported} OPTIONAL,

simultaneousRx-Tx-r11 ENUMERATED {supported} OPTIONAL,

bandParameterList-r11 SEQUENCE (SIZE (1..maxSimultaneousBands-r10)) OF BandParameters-v1130 OPTIONAL,

...

}

BandCombinationParameters-r11 ::= SEQUENCE {

bandParameterList-r11 SEQUENCE (SIZE (1..maxSimultaneousBands-r10)) OF

BandParameters-r11,

supportedBandwidthCombinationSet-r11 SupportedBandwidthCombinationSet-r10 OPTIONAL,

multipleTimingAdvance-r11 ENUMERATED {supported} OPTIONAL,

simultaneousRx-Tx-r11 ENUMERATED {supported} OPTIONAL,

bandInfoEUTRA-r11 BandInfoEUTRA,

...

}

BandCombinationParameters-v1250::= SEQUENCE {

dc-Support-r12 SEQUENCE {

asynchronous-r12 ENUMERATED {supported} OPTIONAL,

supportedCellGrouping-r12 CHOICE {

threeEntries-r12 BIT STRING (SIZE(3)),

fourEntries-r12 BIT STRING (SIZE(7)),

fiveEntries-r12 BIT STRING (SIZE(15))

} OPTIONAL

} OPTIONAL,

supportedNAICS-2CRS-AP-r12 BIT STRING (SIZE (1..maxNAICS-Entries-r12)) OPTIONAL,

commSupportedBandsPerBC-r12 BIT STRING (SIZE (1.. maxBands)) OPTIONAL,

...

}

BandCombinationParameters-v1270 ::= SEQUENCE {

bandParameterList-v1270 SEQUENCE (SIZE (1..maxSimultaneousBands-r10)) OF

BandParameters-v1270 OPTIONAL

}

BandCombinationParameters-r13 ::= SEQUENCE {

differentFallbackSupported-r13 ENUMERATED {true} OPTIONAL,

bandParameterList-r13 SEQUENCE (SIZE (1..maxSimultaneousBands-r10)) OF BandParameters-r13,

supportedBandwidthCombinationSet-r13 SupportedBandwidthCombinationSet-r10 OPTIONAL,

multipleTimingAdvance-r13 ENUMERATED {supported} OPTIONAL,

simultaneousRx-Tx-r13 ENUMERATED {supported} OPTIONAL,

bandInfoEUTRA-r13 BandInfoEUTRA,

dc-Support-r13 SEQUENCE {

asynchronous-r13 ENUMERATED {supported} OPTIONAL,

supportedCellGrouping-r13 CHOICE {

threeEntries-r13 BIT STRING (SIZE(3)),

fourEntries-r13 BIT STRING (SIZE(7)),

fiveEntries-r13 BIT STRING (SIZE(15))

} OPTIONAL

} OPTIONAL,

supportedNAICS-2CRS-AP-r13 BIT STRING (SIZE (1..maxNAICS-Entries-r12)) OPTIONAL,

commSupportedBandsPerBC-r13 BIT STRING (SIZE (1.. maxBands)) OPTIONAL

}

BandCombinationParameters-v1320 ::= SEQUENCE {

bandParameterList-v1320 SEQUENCE (SIZE (1..maxSimultaneousBands-r10)) OF

BandParameters-v1320 OPTIONAL,

additionalRx-Tx-PerformanceReq-r13 ENUMERATED {supported} OPTIONAL

}

BandCombinationParameters-v1380 ::= SEQUENCE {

bandParameterList-v1380 SEQUENCE (SIZE (1..maxSimultaneousBands-r10)) OF

BandParameters-v1380 OPTIONAL

}

BandCombinationParameters-v1390 ::= SEQUENCE {

ue-CA-PowerClass-N-r13 ENUMERATED {class2} OPTIONAL

}

BandCombinationParameters-v1430 ::= SEQUENCE {

bandParameterList-v1430 SEQUENCE (SIZE (1..maxSimultaneousBands-r10)) OF

BandParameters-v1430 OPTIONAL,

v2x-SupportedTxBandCombListPerBC-r14 BIT STRING (SIZE (1.. maxBandComb-r13)) OPTIONAL,

v2x-SupportedRxBandCombListPerBC-r14 BIT STRING (SIZE (1.. maxBandComb-r13)) OPTIONAL

}

BandCombinationParameters-v1450 ::= SEQUENCE {

bandParameterList-v1450 SEQUENCE (SIZE (1..maxSimultaneousBands-r10)) OF

BandParameters-v1450 OPTIONAL

}

BandCombinationParameters-v1470 ::= SEQUENCE {

bandParameterList-v1470 SEQUENCE (SIZE (1..maxSimultaneousBands-r10)) OF

BandParameters-v1470 OPTIONAL,

srs-MaxSimultaneousCCs-r14 INTEGER (1..31) OPTIONAL

}

BandCombinationParameters-v14b0 ::= SEQUENCE {

bandParameterList-v14b0 SEQUENCE (SIZE (1..maxSimultaneousBands-r10)) OF

BandParameters-v14b0 OPTIONAL

}

BandCombinationParameters-v1530 ::= SEQUENCE {

bandParameterList-v1530 SEQUENCE (SIZE (1..maxSimultaneousBands-r10)) OF BandParameters-v1530 OPTIONAL,

spt-Parameters-r15 SPT-Parameters-r15 OPTIONAL

}

-- If an additional band combination parameter is defined, which is supported for MR-DC,

-- it shall be defined in the IE CA-ParametersEUTRA in TS 38.331 [82].

BandCombinationParameters-v1610 ::= SEQUENCE {

measGapInfoNR MeasGapInfoNR OPTIONAL,

bandParameterList-v1610 SEQUENCE (SIZE (1..maxSimultaneousBands-r10)) OF BandParameters-v1610 OPTIONAL,

interFreqDAPS-r16 SEQUENCE {

interFreqAsyncDAPS-r16 ENUMERATED {supported} OPTIONAL,

interFreqMultiUL-TransmissionDAPS-r16 ENUMERATED {supported} OPTIONAL

} OPTIONAL

}

BandCombinationParameters-v1630 ::= SEQUENCE {

v2x-SupportedTxBandCombListPerBC-v1630 BIT STRING (SIZE (1..maxBandCombSidelinkNR-r16)) OPTIONAL,

v2x-SupportedRxBandCombListPerBC-v1630 BIT STRING (SIZE (1..maxBandCombSidelinkNR-r16)) OPTIONAL,

scalingFactorTxSidelink-r16 SEQUENCE (SIZE (1..maxBandCombSidelinkNR-r16)) OF ScalingFactorSidelink-r16 OPTIONAL,

scalingFactorRxSidelink-r16 SEQUENCE (SIZE (1..maxBandCombSidelinkNR-r16)) OF ScalingFactorSidelink-r16 OPTIONAL,

interBandPowerSharingSyncDAPS-r16 ENUMERATED {supported} OPTIONAL,

interBandPowerSharingAsyncDAPS-r16 ENUMERATED {supported} OPTIONAL

}

ScalingFactorSidelink-r16 ::= ENUMERATED {f0p4, f0p75, f0p8, f1}

SupportedBandwidthCombinationSet-r10 ::= BIT STRING (SIZE (1..maxBandwidthCombSet-r10))

BandParameters-r10 ::= SEQUENCE {

bandEUTRA-r10 FreqBandIndicator,

bandParametersUL-r10 BandParametersUL-r10 OPTIONAL,

bandParametersDL-r10 BandParametersDL-r10 OPTIONAL

}

BandParameters-v1090 ::= SEQUENCE {

bandEUTRA-v1090 FreqBandIndicator-v9e0 OPTIONAL,

...

}

BandParameters-v10i0::= SEQUENCE {

bandParametersDL-v10i0 SEQUENCE (SIZE (1..maxBandwidthClass-r10)) OF CA-MIMO-ParametersDL-v10i0

}

BandParameters-v1130 ::= SEQUENCE {

supportedCSI-Proc-r11 ENUMERATED {n1, n3, n4}

}

BandParameters-r11 ::= SEQUENCE {

bandEUTRA-r11 FreqBandIndicator-r11,

bandParametersUL-r11 BandParametersUL-r10 OPTIONAL,

bandParametersDL-r11 BandParametersDL-r10 OPTIONAL,

supportedCSI-Proc-r11 ENUMERATED {n1, n3, n4} OPTIONAL

}

BandParameters-v1270 ::= SEQUENCE {

bandParametersDL-v1270 SEQUENCE (SIZE (1..maxBandwidthClass-r10)) OF CA-MIMO-ParametersDL-v1270

}

BandParameters-r13 ::= SEQUENCE {

bandEUTRA-r13 FreqBandIndicator-r11,

bandParametersUL-r13 BandParametersUL-r13 OPTIONAL,

bandParametersDL-r13 BandParametersDL-r13 OPTIONAL,

supportedCSI-Proc-r13 ENUMERATED {n1, n3, n4} OPTIONAL

}

BandParameters-v1320 ::= SEQUENCE {

bandParametersDL-v1320 MIMO-CA-ParametersPerBoBC-r13

}

BandParameters-v1380 ::= SEQUENCE {

txAntennaSwitchDL-r13 INTEGER (1..32) OPTIONAL,

txAntennaSwitchUL-r13 INTEGER (1..32) OPTIONAL

}

BandParameters-v1430 ::= SEQUENCE {

bandParametersDL-v1430 MIMO-CA-ParametersPerBoBC-v1430 OPTIONAL,

ul-256QAM-r14 ENUMERATED {supported} OPTIONAL,

ul-256QAM-perCC-InfoList-r14 SEQUENCE (SIZE (2..maxServCell-r13)) OF UL-256QAM-perCC-Info-r14 OPTIONAL,

srs-CapabilityPerBandPairList-r14 SEQUENCE (SIZE (1..maxSimultaneousBands-r10)) OF

SRS-CapabilityPerBandPair-r14 OPTIONAL

}

BandParameters-v1450 ::= SEQUENCE {

must-CapabilityPerBand-r14 MUST-Parameters-r14 OPTIONAL

}

BandParameters-v1470 ::= SEQUENCE {

bandParametersDL-v1470 MIMO-CA-ParametersPerBoBC-v1470 OPTIONAL

}

BandParameters-v14b0 ::= SEQUENCE {

srs-CapabilityPerBandPairList-v14b0 SEQUENCE (SIZE (1..maxSimultaneousBands-r10)) OF SRS-CapabilityPerBandPair-v14b0 OPTIONAL

}

BandParameters-v1530 ::= SEQUENCE {

ue-TxAntennaSelection-SRS-1T4R-r15 ENUMERATED {supported} OPTIONAL,

ue-TxAntennaSelection-SRS-2T4R-2Pairs-r15 ENUMERATED {supported} OPTIONAL,

ue-TxAntennaSelection-SRS-2T4R-3Pairs-r15 ENUMERATED {supported} OPTIONAL,

dl-1024QAM-r15 ENUMERATED {supported} OPTIONAL,

qcl-TypeC-Operation-r15 ENUMERATED {supported} OPTIONAL,

qcl-CRI-BasedCSI-Reporting-r15 ENUMERATED {supported} OPTIONAL,

stti-SPT-BandParameters-r15 STTI-SPT-BandParameters-r15 OPTIONAL

}

BandParameters-v1610 ::= SEQUENCE {

intraFreqDAPS-r16 SEQUENCE {

intraFreqAsyncDAPS-r16 ENUMERATED {supported} OPTIONAL,

dummy ENUMERATED {supported} OPTIONAL,

intraFreqTwoTAGs-DAPS-r16 ENUMERATED {supported} OPTIONAL

} OPTIONAL,

addSRS-FrequencyHopping-r16 ENUMERATED {supported} OPTIONAL,

addSRS-AntennaSwitching-r16 SEQUENCE {

addSRS-1T2R-r16 ENUMERATED {supported} OPTIONAL,

addSRS-1T4R-r16 ENUMERATED {supported} OPTIONAL,

addSRS-2T4R-2pairs-r16 ENUMERATED {supported} OPTIONAL,

addSRS-2T4R-3pairs-r16 ENUMERATED {supported} OPTIONAL

} OPTIONAL,

srs-CapabilityPerBandPairList-v1610 SEQUENCE (SIZE (1..maxSimultaneousBands-r10)) OF

SRS-CapabilityPerBandPair-v1610 OPTIONAL

}

V2X-BandParameters-r14 ::= SEQUENCE {

v2x-FreqBandEUTRA-r14 FreqBandIndicator-r11,

bandParametersTxSL-r14 BandParametersTxSL-r14 OPTIONAL,

bandParametersRxSL-r14 BandParametersRxSL-r14 OPTIONAL

}

V2X-BandParameters-v1530 ::= SEQUENCE {

v2x-EnhancedHighReception-r15 ENUMERATED {supported} OPTIONAL

}

BandParametersTxSL-r14 ::= SEQUENCE {

v2x-BandwidthClassTxSL-r14 V2X-BandwidthClassSL-r14,

v2x-eNB-Scheduled-r14 ENUMERATED {supported} OPTIONAL,

v2x-HighPower-r14 ENUMERATED {supported} OPTIONAL

}

BandParametersRxSL-r14 ::= SEQUENCE {

v2x-BandwidthClassRxSL-r14 V2X-BandwidthClassSL-r14,

v2x-HighReception-r14 ENUMERATED {supported} OPTIONAL

}

V2X-BandwidthClassSL-r14 ::= SEQUENCE (SIZE (1..maxBandwidthClass-r10)) OF V2X-BandwidthClass-r14

UL-256QAM-perCC-Info-r14 ::= SEQUENCE {

ul-256QAM-perCC-r14 ENUMERATED {supported} OPTIONAL

}

FeatureSetDL-r15 ::= SEQUENCE {

mimo-CA-ParametersPerBoBC-r15 MIMO-CA-ParametersPerBoBC-r15 OPTIONAL,

featureSetPerCC-ListDL-r15 SEQUENCE (SIZE (1..maxServCell-r13)) OF FeatureSetDL-PerCC-Id-r15

}

FeatureSetDL-v1550 ::= SEQUENCE {

dl-1024QAM-r15 ENUMERATED {supported} OPTIONAL

}

FeatureSetDL-PerCC-r15 ::= SEQUENCE {

fourLayerTM3-TM4-r15 ENUMERATED {supported} OPTIONAL,

supportedMIMO-CapabilityDL-MRDC-r15 MIMO-CapabilityDL-r10 OPTIONAL,

supportedCSI-Proc-r15 ENUMERATED {n1, n3, n4} OPTIONAL

}

FeatureSetUL-r15 ::= SEQUENCE {

featureSetPerCC-ListUL-r15 SEQUENCE (SIZE(1..maxServCell-r13)) OF FeatureSetUL-PerCC-Id-r15

}

FeatureSetUL-PerCC-r15 ::= SEQUENCE {

supportedMIMO-CapabilityUL-r15 MIMO-CapabilityUL-r10 OPTIONAL,

ul-256QAM-r15 ENUMERATED {supported} OPTIONAL

}

FeatureSetDL-PerCC-Id-r15 ::= INTEGER (0..maxPerCC-FeatureSets-r15)

FeatureSetUL-PerCC-Id-r15 ::= INTEGER (0..maxPerCC-FeatureSets-r15)

BandParametersUL-r10 ::= SEQUENCE (SIZE (1..maxBandwidthClass-r10)) OF CA-MIMO-ParametersUL-r10

BandParametersUL-r13 ::= CA-MIMO-ParametersUL-r10

CA-MIMO-ParametersUL-r10 ::= SEQUENCE {

ca-BandwidthClassUL-r10 CA-BandwidthClass-r10,

supportedMIMO-CapabilityUL-r10 MIMO-CapabilityUL-r10 OPTIONAL

}

CA-MIMO-ParametersUL-r15 ::= SEQUENCE {

supportedMIMO-CapabilityUL-r15 MIMO-CapabilityUL-r10 OPTIONAL

}

BandParametersDL-r10 ::= SEQUENCE (SIZE (1..maxBandwidthClass-r10)) OF CA-MIMO-ParametersDL-r10

BandParametersDL-r13 ::= CA-MIMO-ParametersDL-r13

CA-MIMO-ParametersDL-r10 ::= SEQUENCE {

ca-BandwidthClassDL-r10 CA-BandwidthClass-r10,

supportedMIMO-CapabilityDL-r10 MIMO-CapabilityDL-r10 OPTIONAL

}

CA-MIMO-ParametersDL-v10i0 ::= SEQUENCE {

fourLayerTM3-TM4-r10 ENUMERATED {supported} OPTIONAL

}

CA-MIMO-ParametersDL-v1270 ::= SEQUENCE {

intraBandContiguousCC-InfoList-r12 SEQUENCE (SIZE (1..maxServCell-r10)) OF IntraBandContiguousCC-Info-r12

}

CA-MIMO-ParametersDL-r13 ::= SEQUENCE {

ca-BandwidthClassDL-r13 CA-BandwidthClass-r10,

supportedMIMO-CapabilityDL-r13 MIMO-CapabilityDL-r10 OPTIONAL,

fourLayerTM3-TM4-r13 ENUMERATED {supported} OPTIONAL,

intraBandContiguousCC-InfoList-r13 SEQUENCE (SIZE (1..maxServCell-r13)) OF IntraBandContiguousCC-Info-r12

}

CA-MIMO-ParametersDL-r15 ::= SEQUENCE {

supportedMIMO-CapabilityDL-r15 MIMO-CapabilityDL-r10 OPTIONAL,

fourLayerTM3-TM4-r15 ENUMERATED {supported} OPTIONAL,

intraBandContiguousCC-InfoList-r15 SEQUENCE (SIZE (1..maxServCell-r13)) OF

IntraBandContiguousCC-Info-r12 OPTIONAL

}

IntraBandContiguousCC-Info-r12 ::= SEQUENCE {

fourLayerTM3-TM4-perCC-r12 ENUMERATED {supported} OPTIONAL,

supportedMIMO-CapabilityDL-r12 MIMO-CapabilityDL-r10 OPTIONAL,

supportedCSI-Proc-r12 ENUMERATED {n1, n3, n4} OPTIONAL

}

CA-BandwidthClass-r10 ::= ENUMERATED {a, b, c, d, e, f, ...}

V2X-BandwidthClass-r14 ::= ENUMERATED {a, b, c, d, e, f, ..., c1-v1530}

MIMO-CapabilityUL-r10 ::= ENUMERATED {twoLayers, fourLayers}

MIMO-CapabilityDL-r10 ::= ENUMERATED {twoLayers, fourLayers, eightLayers}

MUST-Parameters-r14 ::= SEQUENCE {

must-TM234-UpTo2Tx-r14 ENUMERATED {supported} OPTIONAL,

must-TM89-UpToOneInterferingLayer-r14 ENUMERATED {supported} OPTIONAL,

must-TM10-UpToOneInterferingLayer-r14 ENUMERATED {supported} OPTIONAL,

must-TM89-UpToThreeInterferingLayers-r14 ENUMERATED {supported} OPTIONAL,

must-TM10-UpToThreeInterferingLayers-r14 ENUMERATED {supported} OPTIONAL

}

SupportedBandListEUTRA ::= SEQUENCE (SIZE (1..maxBands)) OF SupportedBandEUTRA

SupportedBandListEUTRA-v9e0::= SEQUENCE (SIZE (1..maxBands)) OF SupportedBandEUTRA-v9e0

SupportedBandListEUTRA-v1250 ::= SEQUENCE (SIZE (1..maxBands)) OF SupportedBandEUTRA-v1250

SupportedBandListEUTRA-v1310 ::= SEQUENCE (SIZE (1..maxBands)) OF SupportedBandEUTRA-v1310

SupportedBandListEUTRA-v1320 ::= SEQUENCE (SIZE (1..maxBands)) OF SupportedBandEUTRA-v1320

SupportedBandEUTRA ::= SEQUENCE {

bandEUTRA FreqBandIndicator,

halfDuplex BOOLEAN

}

SupportedBandEUTRA-v9e0 ::= SEQUENCE {

bandEUTRA-v9e0 FreqBandIndicator-v9e0 OPTIONAL

}

SupportedBandEUTRA-v1250 ::= SEQUENCE {

dl-256QAM-r12 ENUMERATED {supported} OPTIONAL,

ul-64QAM-r12 ENUMERATED {supported} OPTIONAL

}

SupportedBandEUTRA-v1310 ::= SEQUENCE {

ue-PowerClass-5-r13 ENUMERATED {supported} OPTIONAL

}

SupportedBandEUTRA-v1320 ::= SEQUENCE {

intraFreq-CE-NeedForGaps-r13 ENUMERATED {supported} OPTIONAL,

ue-PowerClass-N-r13 ENUMERATED {class1, class2, class4} OPTIONAL

}

MeasParameters ::= SEQUENCE {

bandListEUTRA BandListEUTRA

}

MeasParameters-v1020 ::= SEQUENCE {

bandCombinationListEUTRA-r10 BandCombinationListEUTRA-r10

}

MeasParameters-v1130 ::= SEQUENCE {

rsrqMeasWideband-r11 ENUMERATED {supported} OPTIONAL

}

MeasParameters-v11a0 ::= SEQUENCE {

benefitsFromInterruption-r11 ENUMERATED {true} OPTIONAL

}

MeasParameters-v1250 ::= SEQUENCE {

timerT312-r12 ENUMERATED {supported} OPTIONAL,

alternativeTimeToTrigger-r12 ENUMERATED {supported} OPTIONAL,

incMonEUTRA-r12 ENUMERATED {supported} OPTIONAL,

incMonUTRA-r12 ENUMERATED {supported} OPTIONAL,

extendedMaxMeasId-r12 ENUMERATED {supported} OPTIONAL,

extendedRSRQ-LowerRange-r12 ENUMERATED {supported} OPTIONAL,

rsrq-OnAllSymbols-r12 ENUMERATED {supported} OPTIONAL,

crs-DiscoverySignalsMeas-r12 ENUMERATED {supported} OPTIONAL,

csi-RS-DiscoverySignalsMeas-r12 ENUMERATED {supported} OPTIONAL

}

MeasParameters-v1310 ::= SEQUENCE {

rs-SINR-Meas-r13 ENUMERATED {supported} OPTIONAL,

allowedCellList-r13 ENUMERATED {supported} OPTIONAL,

extendedMaxObjectId-r13 ENUMERATED {supported} OPTIONAL,

ul-PDCP-Delay-r13 ENUMERATED {supported} OPTIONAL,

extendedFreqPriorities-r13 ENUMERATED {supported} OPTIONAL,

multiBandInfoReport-r13 ENUMERATED {supported} OPTIONAL,

rssi-AndChannelOccupancyReporting-r13 ENUMERATED {supported} OPTIONAL

}

MeasParameters-v1430 ::= SEQUENCE {

ceMeasurements-r14 ENUMERATED {supported} OPTIONAL,

ncsg-r14 ENUMERATED {supported} OPTIONAL,

shortMeasurementGap-r14 ENUMERATED {supported} OPTIONAL,

perServingCellMeasurementGap-r14 ENUMERATED {supported} OPTIONAL,

nonUniformGap-r14 ENUMERATED {supported} OPTIONAL

}

MeasParameters-v1520 ::= SEQUENCE {

measGapPatterns-r15 BIT STRING (SIZE (8)) OPTIONAL

}

MeasParameters-v1530 ::= SEQUENCE {

qoe-MeasReport-r15 ENUMERATED {supported} OPTIONAL,

qoe-MTSI-MeasReport-r15 ENUMERATED {supported} OPTIONAL,

ca-IdleModeMeasurements-r15 ENUMERATED {supported} OPTIONAL,

ca-IdleModeValidityArea-r15 ENUMERATED {supported} OPTIONAL,

heightMeas-r15 ENUMERATED {supported} OPTIONAL,

multipleCellsMeasExtension-r15 ENUMERATED {supported} OPTIONAL

}

MeasParameters-v1610 ::= SEQUENCE {

bandInfoNR-v1610 SEQUENCE (SIZE (1..maxBands)) OF MeasGapInfoNR OPTIONAL,

altFreqPriority-r16 ENUMERATED {supported} OPTIONAL,

ce-DL-ChannelQualityReporting-r16 ENUMERATED {supported} OPTIONAL,

ce-MeasRSS-Dedicated-r16 ENUMERATED {supported} OPTIONAL,

eutra-IdleInactiveMeasurements-r16 ENUMERATED {supported} OPTIONAL,

nr-IdleInactiveMeasFR1-r16 ENUMERATED {supported} OPTIONAL,

nr-IdleInactiveMeasFR2-r16 ENUMERATED {supported} OPTIONAL,

idleInactiveValidityAreaList-r16 ENUMERATED {supported} OPTIONAL,

measGapPatterns-NRonly-r16 ENUMERATED {supported} OPTIONAL,

measGapPatterns-NRonly-ENDC-r16 ENUMERATED {supported} OPTIONAL

}

MeasParameters-v1630 ::= SEQUENCE {

nr-IdleInactiveBeamMeasFR1-r16 ENUMERATED {supported} OPTIONAL,

nr-IdleInactiveBeamMeasFR2-r16 ENUMERATED {supported} OPTIONAL,

ce-MeasRSS-DedicatedSameRBs-r16 ENUMERATED {supported} OPTIONAL

}

MeasParameters-v1700 ::= SEQUENCE {

sharedSpectrumMeasNR-EN-DC-r17 SEQUENCE (SIZE (1..maxBandsNR-r15)) OF SharedSpectrumMeasNR-r17 OPTIONAL,

sharedSpectrumMeasNR-SA-r17 SEQUENCE (SIZE (1..maxBandsNR-r15)) OF SharedSpectrumMeasNR-r17 OPTIONAL

}

SharedSpectrumMeasNR-r17 ::= SEQUENCE {

nr-RSSI-ChannelOccupancyReporting-r17 BOOLEAN

}

MeasGapInfoNR ::= SEQUENCE {

interRAT-BandListNR-EN-DC InterRAT-BandListNR OPTIONAL,

interRAT-BandListNR-SA InterRAT-BandListNR OPTIONAL

}

BandListEUTRA ::= SEQUENCE (SIZE (1..maxBands)) OF BandInfoEUTRA

BandCombinationListEUTRA-r10 ::= SEQUENCE (SIZE (1..maxBandComb-r10)) OF BandInfoEUTRA

BandInfoEUTRA ::= SEQUENCE {

interFreqBandList InterFreqBandList,

interRAT-BandList InterRAT-BandList OPTIONAL

}

InterFreqBandList ::= SEQUENCE (SIZE (1..maxBands)) OF InterFreqBandInfo

InterFreqBandInfo ::= SEQUENCE {

interFreqNeedForGaps BOOLEAN

}

InterRAT-BandList ::= SEQUENCE (SIZE (1..maxBands)) OF InterRAT-BandInfo

InterRAT-BandListNR ::= SEQUENCE (SIZE (1..maxBandsNR-r15)) OF InterRAT-BandInfoNR

InterRAT-BandInfo ::= SEQUENCE {

interRAT-NeedForGaps BOOLEAN

}

InterRAT-BandInfoNR ::= SEQUENCE {

interRAT-NeedForGapsNR BOOLEAN

}

IRAT-ParametersNR-r15 ::= SEQUENCE {

en-DC-r15 ENUMERATED {supported} OPTIONAL,

eventB2-r15 ENUMERATED {supported} OPTIONAL,

supportedBandListEN-DC-r15 SupportedBandListNR-r15 OPTIONAL

}

IRAT-ParametersNR-v1540 ::= SEQUENCE {

eutra-5GC-HO-ToNR-FDD-FR1-r15 ENUMERATED {supported} OPTIONAL,

eutra-5GC-HO-ToNR-TDD-FR1-r15 ENUMERATED {supported} OPTIONAL,

eutra-5GC-HO-ToNR-FDD-FR2-r15 ENUMERATED {supported} OPTIONAL,

eutra-5GC-HO-ToNR-TDD-FR2-r15 ENUMERATED {supported} OPTIONAL,

eutra-EPC-HO-ToNR-FDD-FR1-r15 ENUMERATED {supported} OPTIONAL,

eutra-EPC-HO-ToNR-TDD-FR1-r15 ENUMERATED {supported} OPTIONAL,

eutra-EPC-HO-ToNR-FDD-FR2-r15 ENUMERATED {supported} OPTIONAL,

eutra-EPC-HO-ToNR-TDD-FR2-r15 ENUMERATED {supported} OPTIONAL,

ims-VoiceOverNR-FR1-r15 ENUMERATED {supported} OPTIONAL,

ims-VoiceOverNR-FR2-r15 ENUMERATED {supported} OPTIONAL,

sa-NR-r15 ENUMERATED {supported} OPTIONAL,

supportedBandListNR-SA-r15 SupportedBandListNR-r15 OPTIONAL

}

IRAT-ParametersNR-v1560 ::= SEQUENCE {

ng-EN-DC-r15 ENUMERATED {supported} OPTIONAL

}

IRAT-ParametersNR-v1570 ::= SEQUENCE {

ss-SINR-Meas-NR-FR1-r15 ENUMERATED {supported} OPTIONAL,

ss-SINR-Meas-NR-FR2-r15 ENUMERATED {supported} OPTIONAL

}

IRAT-ParametersNR-v1610 ::= SEQUENCE {

nr-HO-ToEN-DC-r16 ENUMERATED {supported} OPTIONAL,

ce-EUTRA-5GC-HO-ToNR-FDD-FR1-r16 ENUMERATED {supported} OPTIONAL,

ce-EUTRA-5GC-HO-ToNR-TDD-FR1-r16 ENUMERATED {supported} OPTIONAL,

ce-EUTRA-5GC-HO-ToNR-FDD-FR2-r16 ENUMERATED {supported} OPTIONAL,

ce-EUTRA-5GC-HO-ToNR-TDD-FR2-r16 ENUMERATED {supported} OPTIONAL

}

IRAT-ParametersNR-v1660 ::= SEQUENCE {

extendedBand-n77-r16 ENUMERATED {supported} OPTIONAL

}

IRAT-ParametersNR-v1700 ::= SEQUENCE {

eutra-5GC-HO-ToNR-TDD-FR2-2-r17 ENUMERATED {supported} OPTIONAL,

eutra-EPC-HO-ToNR-TDD-FR2-2-r17 ENUMERATED {supported} OPTIONAL,

ce-EUTRA-5GC-HO-ToNR-TDD-FR2-2-r17 ENUMERATED {supported} OPTIONAL,

ims-VoiceOverNR-FR2-2-r17 ENUMERATED {supported} OPTIONAL

}

EUTRA-5GC-Parameters-r15 ::= SEQUENCE {

eutra-5GC-r15 ENUMERATED {supported} OPTIONAL,

eutra-EPC-HO-EUTRA-5GC-r15 ENUMERATED {supported} OPTIONAL,

ho-EUTRA-5GC-FDD-TDD-r15 ENUMERATED {supported} OPTIONAL,

ho-InterfreqEUTRA-5GC-r15 ENUMERATED {supported} OPTIONAL,

ims-VoiceOverMCG-BearerEUTRA-5GC-r15 ENUMERATED {supported} OPTIONAL,

inactiveState-r15 ENUMERATED {supported} OPTIONAL,

reflectiveQoS-r15 ENUMERATED {supported} OPTIONAL

}

EUTRA-5GC-Parameters-v1610 ::= SEQUENCE {

ce-InactiveState-r16 ENUMERATED {supported} OPTIONAL,

ce-EUTRA-5GC-r16 ENUMERATED {supported} OPTIONAL

}

PDCP-ParametersNR-r15 ::= SEQUENCE {

rohc-Profiles-r15 ROHC-ProfileSupportList-r15,

rohc-ContextMaxSessions-r15 ENUMERATED {

cs2, cs4, cs8, cs12, cs16, cs24, cs32,

cs48, cs64, cs128, cs256, cs512, cs1024,

cs16384, spare2, spare1} DEFAULT cs16,

rohc-ProfilesUL-Only-r15 SEQUENCE {

profile0x0006-r15 BOOLEAN

},

rohc-ContextContinue-r15 ENUMERATED {supported} OPTIONAL,

outOfOrderDelivery-r15 ENUMERATED {supported} OPTIONAL,

sn-SizeLo-r15 ENUMERATED {supported} OPTIONAL,

ims-VoiceOverNR-PDCP-MCG-Bearer-r15 ENUMERATED {supported} OPTIONAL,

ims-VoiceOverNR-PDCP-SCG-Bearer-r15 ENUMERATED {supported} OPTIONAL

}

PDCP-ParametersNR-v1560 ::= SEQUENCE {

ims-VoNR-PDCP-SCG-NGENDC-r15 ENUMERATED {supported} OPTIONAL

}

ROHC-ProfileSupportList-r15 ::= SEQUENCE {

profile0x0001-r15 BOOLEAN,

profile0x0002-r15 BOOLEAN,

profile0x0003-r15 BOOLEAN,

profile0x0004-r15 BOOLEAN,

profile0x0006-r15 BOOLEAN,

profile0x0101-r15 BOOLEAN,

profile0x0102-r15 BOOLEAN,

profile0x0103-r15 BOOLEAN,

profile0x0104-r15 BOOLEAN

}

SupportedBandListNR-r15 ::= SEQUENCE (SIZE (1..maxBandsNR-r15)) OF SupportedBandNR-r15

SupportedBandNR-r15 ::= SEQUENCE {

bandNR-r15 FreqBandIndicatorNR-r15

}

IRAT-ParametersUTRA-FDD ::= SEQUENCE {

supportedBandListUTRA-FDD SupportedBandListUTRA-FDD

}

IRAT-ParametersUTRA-v920 ::= SEQUENCE {

e-RedirectionUTRA-r9 ENUMERATED {supported}

}

IRAT-ParametersUTRA-v9c0 ::= SEQUENCE {

voiceOverPS-HS-UTRA-FDD-r9 ENUMERATED {supported} OPTIONAL,

voiceOverPS-HS-UTRA-TDD128-r9 ENUMERATED {supported} OPTIONAL,

srvcc-FromUTRA-FDD-ToUTRA-FDD-r9 ENUMERATED {supported} OPTIONAL,

srvcc-FromUTRA-FDD-ToGERAN-r9 ENUMERATED {supported} OPTIONAL,

srvcc-FromUTRA-TDD128-ToUTRA-TDD128-r9 ENUMERATED {supported} OPTIONAL,

srvcc-FromUTRA-TDD128-ToGERAN-r9 ENUMERATED {supported} OPTIONAL

}

IRAT-ParametersUTRA-v9h0 ::= SEQUENCE {

mfbi-UTRA-r9 ENUMERATED {supported}

}

SupportedBandListUTRA-FDD ::= SEQUENCE (SIZE (1..maxBands)) OF SupportedBandUTRA-FDD

SupportedBandUTRA-FDD ::= ENUMERATED {

bandI, bandII, bandIII, bandIV, bandV, bandVI,

bandVII, bandVIII, bandIX, bandX, bandXI,

bandXII, bandXIII, bandXIV, bandXV, bandXVI, ...,

bandXVII-8a0, bandXVIII-8a0, bandXIX-8a0, bandXX-8a0,

bandXXI-8a0, bandXXII-8a0, bandXXIII-8a0, bandXXIV-8a0,

bandXXV-8a0, bandXXVI-8a0, bandXXVII-8a0, bandXXVIII-8a0,

bandXXIX-8a0, bandXXX-8a0, bandXXXI-8a0, bandXXXII-8a0}

IRAT-ParametersUTRA-TDD128 ::= SEQUENCE {

supportedBandListUTRA-TDD128 SupportedBandListUTRA-TDD128

}

SupportedBandListUTRA-TDD128 ::= SEQUENCE (SIZE (1..maxBands)) OF SupportedBandUTRA-TDD128

SupportedBandUTRA-TDD128 ::= ENUMERATED {

a, b, c, d, e, f, g, h, i, j, k, l, m, n,

o, p, ...}

IRAT-ParametersUTRA-TDD384 ::= SEQUENCE {

supportedBandListUTRA-TDD384 SupportedBandListUTRA-TDD384

}

SupportedBandListUTRA-TDD384 ::= SEQUENCE (SIZE (1..maxBands)) OF SupportedBandUTRA-TDD384

SupportedBandUTRA-TDD384 ::= ENUMERATED {

a, b, c, d, e, f, g, h, i, j, k, l, m, n,

o, p, ...}

IRAT-ParametersUTRA-TDD768 ::= SEQUENCE {

supportedBandListUTRA-TDD768 SupportedBandListUTRA-TDD768

}

SupportedBandListUTRA-TDD768 ::= SEQUENCE (SIZE (1..maxBands)) OF SupportedBandUTRA-TDD768

SupportedBandUTRA-TDD768 ::= ENUMERATED {

a, b, c, d, e, f, g, h, i, j, k, l, m, n,

o, p, ...}

IRAT-ParametersUTRA-TDD-v1020 ::= SEQUENCE {

e-RedirectionUTRA-TDD-r10 ENUMERATED {supported}

}

IRAT-ParametersGERAN ::= SEQUENCE {

supportedBandListGERAN SupportedBandListGERAN,

interRAT-PS-HO-ToGERAN BOOLEAN

}

IRAT-ParametersGERAN-v920 ::= SEQUENCE {

dtm-r9 ENUMERATED {supported} OPTIONAL,

e-RedirectionGERAN-r9 ENUMERATED {supported} OPTIONAL

}

SupportedBandListGERAN ::= SEQUENCE (SIZE (1..maxBands)) OF SupportedBandGERAN

SupportedBandGERAN ::= ENUMERATED {

gsm450, gsm480, gsm710, gsm750, gsm810, gsm850,

gsm900P, gsm900E, gsm900R, gsm1800, gsm1900,

spare5, spare4, spare3, spare2, spare1, ...}

IRAT-ParametersCDMA2000-HRPD ::= SEQUENCE {

supportedBandListHRPD SupportedBandListHRPD,

tx-ConfigHRPD ENUMERATED {single, dual},

rx-ConfigHRPD ENUMERATED {single, dual}

}

SupportedBandListHRPD ::= SEQUENCE (SIZE (1..maxCDMA-BandClass)) OF BandclassCDMA2000

IRAT-ParametersCDMA2000-1XRTT ::= SEQUENCE {

supportedBandList1XRTT SupportedBandList1XRTT,

tx-Config1XRTT ENUMERATED {single, dual},

rx-Config1XRTT ENUMERATED {single, dual}

}

IRAT-ParametersCDMA2000-1XRTT-v920 ::= SEQUENCE {

e-CSFB-1XRTT-r9 ENUMERATED {supported},

e-CSFB-ConcPS-Mob1XRTT-r9 ENUMERATED {supported} OPTIONAL

}

IRAT-ParametersCDMA2000-1XRTT-v1020 ::= SEQUENCE {

e-CSFB-dual-1XRTT-r10 ENUMERATED {supported}

}

IRAT-ParametersCDMA2000-v1130 ::= SEQUENCE {

cdma2000-NW-Sharing-r11 ENUMERATED {supported} OPTIONAL

}

SupportedBandList1XRTT ::= SEQUENCE (SIZE (1..maxCDMA-BandClass)) OF BandclassCDMA2000

IRAT-ParametersWLAN-r13 ::= SEQUENCE {

supportedBandListWLAN-r13 SEQUENCE (SIZE (1..maxWLAN-Bands-r13)) OF WLAN-BandIndicator-r13 OPTIONAL

}

CSG-ProximityIndicationParameters-r9 ::= SEQUENCE {

intraFreqProximityIndication-r9 ENUMERATED {supported} OPTIONAL,

interFreqProximityIndication-r9 ENUMERATED {supported} OPTIONAL,

utran-ProximityIndication-r9 ENUMERATED {supported} OPTIONAL

}

NeighCellSI-AcquisitionParameters-r9 ::= SEQUENCE {

intraFreqSI-AcquisitionForHO-r9 ENUMERATED {supported} OPTIONAL,

interFreqSI-AcquisitionForHO-r9 ENUMERATED {supported} OPTIONAL,

utran-SI-AcquisitionForHO-r9 ENUMERATED {supported} OPTIONAL

}

NeighCellSI-AcquisitionParameters-v1530 ::= SEQUENCE {

reportCGI-NR-EN-DC-r15 ENUMERATED {supported} OPTIONAL,

reportCGI-NR-NoEN-DC-r15 ENUMERATED {supported} OPTIONAL

}

NeighCellSI-AcquisitionParameters-v1550 ::= SEQUENCE {

eutra-CGI-Reporting-ENDC-r15 ENUMERATED {supported} OPTIONAL,

utra-GERAN-CGI-Reporting-ENDC-r15 ENUMERATED {supported} OPTIONAL

}

NeighCellSI-AcquisitionParameters-v15a0 ::= SEQUENCE {

eutra-CGI-Reporting-NEDC-r15 ENUMERATED {supported} OPTIONAL

}

NeighCellSI-AcquisitionParameters-v1610 ::= SEQUENCE {

eutra-SI-AcquisitionForHO-ENDC-r16 ENUMERATED {supported} OPTIONAL,

nr-AutonomousGaps-ENDC-FR1-r16 ENUMERATED {supported} OPTIONAL,

nr-AutonomousGaps-ENDC-FR2-r16 ENUMERATED {supported} OPTIONAL,

nr-AutonomousGaps-FR1-r16 ENUMERATED {supported} OPTIONAL,

nr-AutonomousGaps-FR2-r16 ENUMERATED {supported} OPTIONAL

}

SON-Parameters-r9 ::= SEQUENCE {

rach-Report-r9 ENUMERATED {supported} OPTIONAL

}

PUR-Parameters-r16 ::= SEQUENCE {

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

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

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

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

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

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

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

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

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

pur-FrequencyHopping-r16 ENUMERATED {supported} OPTIONAL,

pur-PUSCH-NB-MaxTBS-r16 ENUMERATED {supported} OPTIONAL,

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

pur-SubPRB-CE-ModeA-r16 ENUMERATED {supported} OPTIONAL,

pur-SubPRB-CE-ModeB-r16 ENUMERATED {supported} OPTIONAL

}

UE-BasedNetwPerfMeasParameters-r10 ::= SEQUENCE {

loggedMeasurementsIdle-r10 ENUMERATED {supported} OPTIONAL,

standaloneGNSS-Location-r10 ENUMERATED {supported} OPTIONAL

}

UE-BasedNetwPerfMeasParameters-v1250 ::= SEQUENCE {

loggedMBSFNMeasurements-r12 ENUMERATED {supported}

}

UE-BasedNetwPerfMeasParameters-v1430 ::= SEQUENCE {

locationReport-r14 ENUMERATED {supported} OPTIONAL

}

UE-BasedNetwPerfMeasParameters-v1530 ::= SEQUENCE {

loggedMeasBT-r15 ENUMERATED {supported} OPTIONAL,

loggedMeasWLAN-r15 ENUMERATED {supported} OPTIONAL,

immMeasBT-r15 ENUMERATED {supported} OPTIONAL,

immMeasWLAN-r15 ENUMERATED {supported} OPTIONAL

}

UE-BasedNetwPerfMeasParameters-v1610 ::= SEQUENCE {

ul-PDCP-AvgDelay-r16 ENUMERATED {supported} OPTIONAL

}

UE-BasedNetwPerfMeasParameters-v1700 ::= SEQUENCE {

loggedMeasIdleEventL1-r17 ENUMERATED {supported} OPTIONAL,

loggedMeasIdleEventOutOfCoverage-r17 ENUMERATED {supported} OPTIONAL,

loggedMeasUncomBarPre-r17 ENUMERATED {supported} OPTIONAL,

immMeasUncomBarPre-r17 ENUMERATED {supported} OPTIONAL

}

OTDOA-PositioningCapabilities-r10 ::= SEQUENCE {

otdoa-UE-Assisted-r10 ENUMERATED {supported},

interFreqRSTD-Measurement-r10 ENUMERATED {supported} OPTIONAL

}

Other-Parameters-r11 ::= SEQUENCE {

inDeviceCoexInd-r11 ENUMERATED {supported} OPTIONAL,

powerPrefInd-r11 ENUMERATED {supported} OPTIONAL,

ue-Rx-TxTimeDiffMeasurements-r11 ENUMERATED {supported} OPTIONAL

}

Other-Parameters-v11d0 ::= SEQUENCE {

inDeviceCoexInd-UL-CA-r11 ENUMERATED {supported} OPTIONAL

}

Other-Parameters-v1360 ::= SEQUENCE {

inDeviceCoexInd-HardwareSharingInd-r13 ENUMERATED {supported} OPTIONAL

}

Other-Parameters-v1430 ::= SEQUENCE {

bwPrefInd-r14 ENUMERATED {supported} OPTIONAL,

rlm-ReportSupport-r14 ENUMERATED {supported} OPTIONAL

}

OtherParameters-v1450 ::= SEQUENCE {

overheatingInd-r14 ENUMERATED {supported} OPTIONAL

}

Other-Parameters-v1460 ::= SEQUENCE {

nonCSG-SI-Reporting-r14 ENUMERATED {supported} OPTIONAL

}

Other-Parameters-v1530 ::= SEQUENCE {

assistInfoBitForLC-r15 ENUMERATED {supported} OPTIONAL,

timeReferenceProvision-r15 ENUMERATED {supported} OPTIONAL,

flightPathPlan-r15 ENUMERATED {supported} OPTIONAL

}

Other-Parameters-v1540 ::= SEQUENCE {

inDeviceCoexInd-ENDC-r15 ENUMERATED {supported} OPTIONAL

}

Other-Parameters-v1610 ::= SEQUENCE {

resumeWithStoredMCG-SCells-r16 ENUMERATED {supported} OPTIONAL,

resumeWithMCG-SCellConfig-r16 ENUMERATED {supported} OPTIONAL,

resumeWithStoredSCG-r16 ENUMERATED {supported} OPTIONAL,

resumeWithSCG-Config-r16 ENUMERATED {supported} OPTIONAL,

mcgRLF-RecoveryViaSCG-r16 ENUMERATED {supported} OPTIONAL,

overheatingIndForSCG-r16 ENUMERATED {supported} OPTIONAL

}

Other-Parameters-v1650 ::= SEQUENCE {

mpsPriorityIndication-r16 ENUMERATED {supported} OPTIONAL

}

MBMS-Parameters-r11 ::= SEQUENCE {

mbms-SCell-r11 ENUMERATED {supported} OPTIONAL,

mbms-NonServingCell-r11 ENUMERATED {supported} OPTIONAL

}

MBMS-Parameters-v1250 ::= SEQUENCE {

mbms-AsyncDC-r12 ENUMERATED {supported} OPTIONAL

}

MBMS-Parameters-v1430 ::= SEQUENCE {

fembmsDedicatedCell-r14 ENUMERATED {supported} OPTIONAL,

fembmsMixedCell-r14 ENUMERATED {supported} OPTIONAL,

subcarrierSpacingMBMS-khz7dot5-r14 ENUMERATED {supported} OPTIONAL,

subcarrierSpacingMBMS-khz1dot25-r14 ENUMERATED {supported} OPTIONAL

}

MBMS-Parameters-v1470 ::= SEQUENCE {

mbms-MaxBW-r14 CHOICE {

implicitValue NULL,

explicitValue INTEGER(2..20)

},

mbms-ScalingFactor1dot25-r14 ENUMERATED {n3, n6, n9, n12} OPTIONAL,

mbms-ScalingFactor7dot5-r14 ENUMERATED {n1, n2, n3, n4} OPTIONAL

}

MBMS-Parameters-v1610 ::= SEQUENCE {

mbms-ScalingFactor2dot5-r16 ENUMERATED {n2, n4, n6, n8} OPTIONAL,

mbms-ScalingFactor0dot37-r16 ENUMERATED {n12, n16, n20, n24} OPTIONAL,

mbms-SupportedBandInfoList-r16 SEQUENCE (SIZE (1..maxBands)) OF MBMS-SupportedBandInfo-r16

}

MBMS-Parameters-v1700 ::= SEQUENCE {

mbms-SupportedBandInfoList-v1700 SEQUENCE (SIZE (1..maxBands)) OF MBMS-SupportedBandInfo-v1700 OPTIONAL

}

MBMS-SupportedBandInfo-r16 ::= SEQUENCE {

subcarrierSpacingMBMS-khz2dot5-r16 ENUMERATED {supported} OPTIONAL,

subcarrierSpacingMBMS-khz0dot37-r16 SEQUENCE {

timeSeparationSlot2-r16 ENUMERATED {supported} OPTIONAL,

timeSeparationSlot4-r16 ENUMERATED {supported} OPTIONAL

} OPTIONAL

}

MBMS-SupportedBandInfo-v1700 ::= SEQUENCE {

pmch-Bandwidth-n40-r17 ENUMERATED {supported} OPTIONAL,

pmch-Bandwidth-n35-r17 ENUMERATED {supported} OPTIONAL,

pmch-Bandwidth-n30-r17 ENUMERATED {supported} OPTIONAL

}

FeMBMS-Unicast-Parameters-r14 ::= SEQUENCE {

unicast-fembmsMixedSCell-r14 ENUMERATED {supported} OPTIONAL,

emptyUnicastRegion-r14 ENUMERATED {supported} OPTIONAL

}

SCPTM-Parameters-r13 ::= SEQUENCE {

scptm-ParallelReception-r13 ENUMERATED {supported} OPTIONAL,

scptm-SCell-r13 ENUMERATED {supported} OPTIONAL,

scptm-NonServingCell-r13 ENUMERATED {supported} OPTIONAL,

scptm-AsyncDC-r13 ENUMERATED {supported} OPTIONAL

}

CE-Parameters-r13 ::= SEQUENCE {

ce-ModeA-r13 ENUMERATED {supported} OPTIONAL,

ce-ModeB-r13 ENUMERATED {supported} OPTIONAL

}

CE-Parameters-v1320 ::= SEQUENCE {

intraFreqA3-CE-ModeA-r13 ENUMERATED {supported} OPTIONAL,

intraFreqA3-CE-ModeB-r13 ENUMERATED {supported} OPTIONAL,

intraFreqHO-CE-ModeA-r13 ENUMERATED {supported} OPTIONAL,

intraFreqHO-CE-ModeB-r13 ENUMERATED {supported} OPTIONAL

}

CE-Parameters-v1350 ::= SEQUENCE {

unicastFrequencyHopping-r13 ENUMERATED {supported} OPTIONAL

}

CE-Parameters-v1370 ::= SEQUENCE {

tm9-CE-ModeA-r13 ENUMERATED {supported} OPTIONAL,

tm9-CE-ModeB-r13 ENUMERATED {supported} OPTIONAL

}

CE-Parameters-v1380 ::= SEQUENCE {

tm6-CE-ModeA-r13 ENUMERATED {supported} OPTIONAL

}

CE-Parameters-v1430 ::= SEQUENCE {

ce-SwitchWithoutHO-r14 ENUMERATED {supported} OPTIONAL

}

CE-MultiTB-Parameters-r16 ::= SEQUENCE {

pdsch-MultiTB-CE-ModeA-r16 ENUMERATED {supported} OPTIONAL,

pdsch-MultiTB-CE-ModeB-r16 ENUMERATED {supported} OPTIONAL,

pusch-MultiTB-CE-ModeA-r16 ENUMERATED {supported} OPTIONAL,

pusch-MultiTB-CE-ModeB-r16 ENUMERATED {supported} OPTIONAL,

ce-MultiTB-64QAM-r16 ENUMERATED {supported} OPTIONAL,

ce-MultiTB-EarlyTermination-r16 ENUMERATED {supported} OPTIONAL,

ce-MultiTB-FrequencyHopping-r16 ENUMERATED {supported} OPTIONAL,

ce-MultiTB-HARQ-AckBundling-r16 ENUMERATED {supported} OPTIONAL,

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

ce-MultiTB-SubPRB-r16 ENUMERATED {supported} OPTIONAL

}

CE-ResourceResvParameters-r16 ::= SEQUENCE {

subframeResourceResvDL-CE-ModeA-r16 ENUMERATED {supported} OPTIONAL,

subframeResourceResvDL-CE-ModeB-r16 ENUMERATED {supported} OPTIONAL,

subframeResourceResvUL-CE-ModeA-r16 ENUMERATED {supported} OPTIONAL,

subframeResourceResvUL-CE-ModeB-r16 ENUMERATED {supported} OPTIONAL,

slotSymbolResourceResvDL-CE-ModeA-r16 ENUMERATED {supported} OPTIONAL,

slotSymbolResourceResvDL-CE-ModeB-r16 ENUMERATED {supported} OPTIONAL,

slotSymbolResourceResvUL-CE-ModeA-r16 ENUMERATED {supported} OPTIONAL,

slotSymbolResourceResvUL-CE-ModeB-r16 ENUMERATED {supported} OPTIONAL,

subcarrierPuncturingCE-ModeA-r16 ENUMERATED {supported} OPTIONAL,

subcarrierPuncturingCE-ModeB-r16 ENUMERATED {supported} OPTIONAL

}

LAA-Parameters-r13 ::= SEQUENCE {

crossCarrierSchedulingLAA-DL-r13 ENUMERATED {supported} OPTIONAL,

csi-RS-DRS-RRM-MeasurementsLAA-r13 ENUMERATED {supported} OPTIONAL,

downlinkLAA-r13 ENUMERATED {supported} OPTIONAL,

endingDwPTS-r13 ENUMERATED {supported} OPTIONAL,

secondSlotStartingPosition-r13 ENUMERATED {supported} OPTIONAL,

tm9-LAA-r13 ENUMERATED {supported} OPTIONAL,

tm10-LAA-r13 ENUMERATED {supported} OPTIONAL

}

LAA-Parameters-v1430 ::= SEQUENCE {

crossCarrierSchedulingLAA-UL-r14 ENUMERATED {supported} OPTIONAL,

uplinkLAA-r14 ENUMERATED {supported} OPTIONAL,

twoStepSchedulingTimingInfo-r14 ENUMERATED {nPlus1, nPlus2, nPlus3} OPTIONAL,

uss-BlindDecodingAdjustment-r14 ENUMERATED {supported} OPTIONAL,

uss-BlindDecodingReduction-r14 ENUMERATED {supported} OPTIONAL,

outOfSequenceGrantHandling-r14 ENUMERATED {supported} OPTIONAL

}

LAA-Parameters-v1530 ::= SEQUENCE {

aul-r15 ENUMERATED {supported} OPTIONAL,

laa-PUSCH-Mode1-r15 ENUMERATED {supported} OPTIONAL,

laa-PUSCH-Mode2-r15 ENUMERATED {supported} OPTIONAL,

laa-PUSCH-Mode3-r15 ENUMERATED {supported} OPTIONAL

}

WLAN-IW-Parameters-r12 ::= SEQUENCE {

wlan-IW-RAN-Rules-r12 ENUMERATED {supported} OPTIONAL,

wlan-IW-ANDSF-Policies-r12 ENUMERATED {supported} OPTIONAL

}

LWA-Parameters-r13 ::= SEQUENCE {

lwa-r13 ENUMERATED {supported} OPTIONAL,

lwa-SplitBearer-r13 ENUMERATED {supported} OPTIONAL,

wlan-MAC-Address-r13 OCTET STRING (SIZE (6)) OPTIONAL,

lwa-BufferSize-r13 ENUMERATED {supported} OPTIONAL

}

LWA-Parameters-v1430 ::= SEQUENCE {

lwa-HO-WithoutWT-Change-r14 ENUMERATED {supported} OPTIONAL,

lwa-UL-r14 ENUMERATED {supported} OPTIONAL,

wlan-PeriodicMeas-r14 ENUMERATED {supported} OPTIONAL,

wlan-ReportAnyWLAN-r14 ENUMERATED {supported} OPTIONAL,

wlan-SupportedDataRate-r14 INTEGER (1..2048) OPTIONAL

}

LWA-Parameters-v1440 ::= SEQUENCE {

lwa-RLC-UM-r14 ENUMERATED {supported} OPTIONAL

}

WLAN-IW-Parameters-v1310 ::= SEQUENCE {

rclwi-r13 ENUMERATED {supported} OPTIONAL

}

LWIP-Parameters-r13 ::= SEQUENCE {

lwip-r13 ENUMERATED {supported} OPTIONAL

}

LWIP-Parameters-v1430 ::= SEQUENCE {

lwip-Aggregation-DL-r14 ENUMERATED {supported} OPTIONAL,

lwip-Aggregation-UL-r14 ENUMERATED {supported} OPTIONAL

}

NAICS-Capability-List-r12 ::= SEQUENCE (SIZE (1..maxNAICS-Entries-r12)) OF NAICS-Capability-Entry-r12

NAICS-Capability-Entry-r12 ::= SEQUENCE {

numberOfNAICS-CapableCC-r12 INTEGER(1..5),

numberOfAggregatedPRB-r12 ENUMERATED {

n50, n75, n100, n125, n150, n175,

n200, n225, n250, n275, n300, n350,

n400, n450, n500, spare},

...

}

SL-Parameters-r12 ::= SEQUENCE {

commSimultaneousTx-r12 ENUMERATED {supported} OPTIONAL,

commSupportedBands-r12 FreqBandIndicatorListEUTRA-r12 OPTIONAL,

discSupportedBands-r12 SupportedBandInfoList-r12 OPTIONAL,

discScheduledResourceAlloc-r12 ENUMERATED {supported} OPTIONAL,

disc-UE-SelectedResourceAlloc-r12 ENUMERATED {supported} OPTIONAL,

disc-SLSS-r12 ENUMERATED {supported} OPTIONAL,

discSupportedProc-r12 ENUMERATED {n50, n400} OPTIONAL

}

SL-Parameters-v1310 ::= SEQUENCE {

discSysInfoReporting-r13 ENUMERATED {supported} OPTIONAL,

commMultipleTx-r13 ENUMERATED {supported} OPTIONAL,

discInterFreqTx-r13 ENUMERATED {supported} OPTIONAL,

discPeriodicSLSS-r13 ENUMERATED {supported} OPTIONAL

}

SL-Parameters-v1430 ::= SEQUENCE {

zoneBasedPoolSelection-r14 ENUMERATED {supported} OPTIONAL,

ue-AutonomousWithFullSensing-r14 ENUMERATED {supported} OPTIONAL,

ue-AutonomousWithPartialSensing-r14 ENUMERATED {supported} OPTIONAL,

sl-CongestionControl-r14 ENUMERATED {supported} OPTIONAL,

v2x-TxWithShortResvInterval-r14 ENUMERATED {supported} OPTIONAL,

v2x-numberTxRxTiming-r14 INTEGER(1..16) OPTIONAL,

v2x-nonAdjacentPSCCH-PSSCH-r14 ENUMERATED {supported} OPTIONAL,

slss-TxRx-r14 ENUMERATED {supported} OPTIONAL,

v2x-SupportedBandCombinationList-r14 V2X-SupportedBandCombination-r14 OPTIONAL

}

SL-Parameters-v1530 ::= SEQUENCE {

slss-SupportedTxFreq-r15 ENUMERATED {single, multiple} OPTIONAL,

sl-64QAM-Tx-r15 ENUMERATED {supported} OPTIONAL,

sl-TxDiversity-r15 ENUMERATED {supported} OPTIONAL,

ue-CategorySL-r15 UE-CategorySL-r15 OPTIONAL,

v2x-SupportedBandCombinationList-v1530 V2X-SupportedBandCombination-v1530 OPTIONAL

}

SL-Parameters-v1540 ::= SEQUENCE {

sl-64QAM-Rx-r15 ENUMERATED {supported} OPTIONAL,

sl-RateMatchingTBSScaling-r15 ENUMERATED {supported} OPTIONAL,

sl-LowT2min-r15 ENUMERATED {supported} OPTIONAL,

v2x-SensingReportingMode3-r15 ENUMERATED {supported} OPTIONAL

}

SL-Parameters-v1610 ::= SEQUENCE {

sl-ParameterNR-r16 OCTET STRING OPTIONAL,

dummy V2X-SupportedBandCombinationEUTRA-NR-r16 OPTIONAL

}

SL-Parameters-v1630 ::= SEQUENCE {

v2x-SupportedBandCombinationListEUTRA-NR-r16 V2X-SupportedBandCombinationEUTRA-NR-v1630 OPTIONAL

}

UE-CategorySL-r15 ::= SEQUENCE {

ue-CategorySL-C-TX-r15 INTEGER(1..5),

ue-CategorySL-C-RX-r15 INTEGER(1..4)

}

V2X-SupportedBandCombination-r14 ::= SEQUENCE (SIZE (1..maxBandComb-r13)) OF V2X-BandCombinationParameters-r14

V2X-SupportedBandCombination-v1530 ::= SEQUENCE (SIZE (1..maxBandComb-r13)) OF V2X-BandCombinationParameters-v1530

V2X-BandCombinationParameters-r14 ::= SEQUENCE (SIZE (1.. maxSimultaneousBands-r10)) OF V2X-BandParameters-r14

V2X-BandCombinationParameters-v1530 ::= SEQUENCE (SIZE (1.. maxSimultaneousBands-r10)) OF V2X-BandParameters-v1530

V2X-SupportedBandCombinationEUTRA-NR-r16 ::= SEQUENCE (SIZE (1..maxBandCombSidelinkNR-r16)) OF V2X-BandParametersEUTRA-NR-r16

V2X-SupportedBandCombinationEUTRA-NR-v1630 ::= SEQUENCE (SIZE (1..maxBandCombSidelinkNR-r16)) OF V2X-BandCombinationParametersEUTRA-NR-v1630

V2X-BandCombinationParametersEUTRA-NR-v1630 ::= SEQUENCE {

bandListSidelinkEUTRA-NR-r16 SEQUENCE (SIZE (1.. maxSimultaneousBands-r10)) OF V2X-BandParametersEUTRA-NR-r16,

bandListSidelinkEUTRA-NR-v1630 SEQUENCE (SIZE (1.. maxSimultaneousBands-r10)) OF V2X-BandParametersEUTRA-NR-v1630

}

V2X-BandParametersEUTRA-NR-r16 ::= CHOICE {

eutra SEQUENCE {

v2x-BandParameters1-r16 V2X-BandParameters-r14 OPTIONAL,

v2x-BandParameters2-r16 V2X-BandParameters-v1530 OPTIONAL

},

nr SEQUENCE {

v2x-BandParametersNR-r16 OCTET STRING OPTIONAL

}

}

V2X-BandParametersEUTRA-NR-v1630 ::= CHOICE {

eutra NULL,

nr SEQUENCE {

tx-Sidelink-r16 ENUMERATED {supported} OPTIONAL,

rx-Sidelink-r16 ENUMERATED {supported} OPTIONAL

}

}

SupportedBandInfoList-r12 ::= SEQUENCE (SIZE (1..maxBands)) OF SupportedBandInfo-r12

SupportedBandInfo-r12 ::= SEQUENCE {

support-r12 ENUMERATED {supported} OPTIONAL

}

FreqBandIndicatorListEUTRA-r12 ::= SEQUENCE (SIZE (1..maxBands)) OF FreqBandIndicator-r11

MMTEL-Parameters-r14 ::= SEQUENCE {

delayBudgetReporting-r14 ENUMERATED {supported} OPTIONAL,

pusch-Enhancements-r14 ENUMERATED {supported} OPTIONAL,

recommendedBitRate-r14 ENUMERATED {supported} OPTIONAL,

recommendedBitRateQuery-r14 ENUMERATED {supported} OPTIONAL

}

MMTEL-Parameters-v1610 ::= SEQUENCE {

recommendedBitRateMultiplier-r16 ENUMERATED {supported} OPTIONAL

}

SRS-CapabilityPerBandPair-r14 ::= SEQUENCE {

retuningInfo SEQUENCE {

rf-RetuningTimeDL-r14 ENUMERATED {n0, n0dot5, n1, n1dot5, n2, n2dot5, n3,

n3dot5, n4, n4dot5, n5, n5dot5, n6, n6dot5,

n7, spare1} OPTIONAL,

rf-RetuningTimeUL-r14 ENUMERATED {n0, n0dot5, n1, n1dot5, n2, n2dot5, n3,

n3dot5, n4, n4dot5, n5, n5dot5, n6, n6dot5,

n7, spare1} OPTIONAL

}

}

SRS-CapabilityPerBandPair-v14b0 ::= SEQUENCE {

srs-FlexibleTiming-r14 ENUMERATED {supported} OPTIONAL,

srs-HARQ-ReferenceConfig-r14 ENUMERATED {supported} OPTIONAL

}

SRS-CapabilityPerBandPair-v1610::= SEQUENCE {

addSRS-CarrierSwitching-r16 ENUMERATED {supported} OPTIONAL

}

HighSpeedEnhParameters-r14 ::= SEQUENCE {

measurementEnhancements-r14 ENUMERATED {supported} OPTIONAL,

demodulationEnhancements-r14 ENUMERATED {supported} OPTIONAL,

prach-Enhancements-r14 ENUMERATED {supported} OPTIONAL

}

HighSpeedEnhParameters-v1610 ::= SEQUENCE {

measurementEnhancementsSCell-r16 ENUMERATED {supported} OPTIONAL,

measurementEnhancements2-r16 ENUMERATED {supported} OPTIONAL,

demodulationEnhancements2-r16 ENUMERATED {supported} OPTIONAL,

interRAT-enhancementNR-r16 ENUMERATED {supported} OPTIONAL

}

-- ASN1STOP

| *UE-EUTRA-Capability* field descriptions | | *FDD/ TDD diff* |
| --- | --- | --- |
| ***accessStratumRelease***  Set to rel17 in this version of the specification. NOTE 7. | | - |
| ***additionalRx-Tx-PerformanceReq***  Indicates whether the UE supports the additional Rx and Tx performance requirement for a given band combination as specified in TS 36.101 [42]. | | - |
| ***addSRS***  Presence of this field indicates the UE supports the additional SRS symbol(s) within the normal UL subframes in TDD as described in TS 36.213 [23]. | | - |
| ***addSRS-1T2R***  Indicates whether the UE supports selecting one antenna among two antennas to transmit additional SRS symbol(s) for the corresponding band of the band combination as described in TS 36.213 [23]. | | - |
| ***addSRS-1T4R***  Indicates whether the UE supports selecting one antenna among four antennas to transmit additional SRS symbol(s) for the corresponding band of the band combination as described in TS 36.213 [23]. | | - |
| ***addSRS-2T4R-2Pairs***  Indicates whether the UE supports selecting one antenna pair between two antenna pairs to transmit additional SRS symbol(s) simultaneously for the corresponding band of the band combination as described in TS 36.213 [23]. | | - |
| ***addSRS-2T4R-3Pairs***  Indicates whether the UE supports selecting one antenna pair among three antenna pairs to transmit additional SRS symbol(s) simultaneously for the corresponding band of the band combination as described in TS 36.213 [23]. | | - |
| ***addSRS-AntennaSwitching (in addSRS)***  Value *useBasic* indicates the antenna switching capabilities for additional SRS symbol(s) for a band of band combination for which the capability is not signalled in *bandParameterList-v1610* is the same as indicated by *bandParameterList-v1380* and/or *bandParameterList-v1530* for the concerned band of band combination. | | - |
| ***addSRS-AntennaSwitching (in bandParameterList-v1610)***  If signalled, the field indicates the antenna switching capabilities for additional SRS symbol(s) for the concerned band of band combination. | | - |
| ***addSRS-CarrierSwitching (in addSRS)***  Indicates whether carrier switching is supported for additional SRS symbol(s) for all band pairs of band combinations for which UE supports SRS carrier switching. This field is included only if *srs-CapabilityPerBandPairList-r14* is included. If this field is included, *addSRS-CarrierSwitching* (in *bandParameterList-v1610*) is not included. | | - |
| ***addSRS-CarrierSwitching (in bandParameterList-v1610)***  Indicates whether carrier switching is supported for additional SRS symbol(s) for the concerned band pair of band combination. This field is included only if *srs-CapabilityPerBandPairList-r14* is included.If this field is included, *addSRS-CarrierSwitching* (in *addSRS*) is not included. | | - |
| ***addSRS-FrequencyHopping (in addSRS)***  Indicates whether frequency hopping is supported for additional SRS symbol(s) for all bands of band combinations for which the capability is not signalled in *bandParameterList-v1610*. | | - |
| ***addSRS-FrequencyHopping (in bandParameterList-v1610)***  If signalled, the field indicates whether frequency hopping is supported for additional SRS symbol(s) for the concerned band of band combination. | | - |
| ***allowedCellList***  Indicates whether the UE supports EUTRA allowed-cell listing to limit the set of cells applicable for measurements. | | - |
| ***alternativeTBS-Indices***  Indicates whether the UE supports alternative TBS indices *I*TBS 26A and 33A as specified in TS 36.213 [23]. | | - |
| ***alternativeTBS-Index***  Indicates whether the UE supports alternative TBS index ITBS 33B as specified in TS 36.213 [23]. | | No |
| ***alternativeTimeToTrigger***  Indicates whether the UE supports alternativeTimeToTrigger. | | No |
| ***altFreqPriority***  Indicates whether the UE supports alternative cell reselection priority. | | No |
| ***altMCS-Table***  Indicates whether the UE supports the 6-bit MCS table as specified in TS 36.212 [22] and TS 36.213 [23]. | | Yes |
| ***aperiodicCSI-Reporting***  Indicates whether the UE supports aperiodic CSI reporting with 3 bits of the CSI request field size as specified in TS 36.213 [23], clause 7.2.1 and/or aperiodic CSI reporting mode 1-0 and mode 1-1 as specified in TS 36.213 [23], clause 7.2.1. The first bit is set to "1" if the UE supports the aperiodic CSI reporting with 3 bits of the CSI request field size. The second bit is set to "1" if the UE supports the aperiodic CSI reporting mode 1-0 and mode 1-1. | | No |
| ***aperiodicCsi-ReportingSTTI***  Indicates whether the UE supports aperiodic CSI reporting for short TTI as specified in TS 36.213 [23], clause 7.2.1. | | Yes |
| ***appliedCapabilityFilterCommon***  Contains the filter, applied by the UE, common for all MR-DC related capability containers that are requested and as defined by *UE-CapabilityRequestFilterCommon* IE in TS 38.331 [82]. | | - |
| ***assistInfoBitForLC***  Indicates whether the UE supports assistance information bit for local cache. | | - |
| ***aul***  Indicates whether the UE supports AUL as specified n TS 36.321 [6]. | | - |
| ***bandCombinationListEUTRA***  One entry corresponding to each supported band combination listed in the same order as in *supportedBandCombination.* | | - |
| ***BandCombinationParameters-v1090, BandCombinationParameters-v10i0, BandCombinationParameters-v1270***  If included, the UE shall include the same number of entries, and listed in the same order, as in *BandCombinationParameters-r10*. | | - |
| ***BandCombinationParameters-v1130***  The field is applicable to each supported CA bandwidth class combination (i.e. CA configuration in TS 36.101 [42], clause 5.6A.1) indicated in the corresponding band combination. If included, the UE shall include the same number of entries, and listed in the same order, as in *BandCombinationParameters-r10*. | | - |
| ***bandEUTRA***  E‑UTRA band as defined in TS 36.101 [42]. In case the UE includes *bandEUTRA-v9e0* or *bandEUTRA-v1090*, the UE shall set the corresponding entry of *bandEUTRA* (i.e. without suffix) or *bandEUTRA-r10* respectively to *maxFBI*. | | - |
| ***bandInfoNR-v1610***  One entry corresponding to each supported E-UTRA band listed in the same order as in *supportedBandListEUTRA*. If absent, network assumes gap is required when measurement is performed on any NR bands while UE is served by cell(s) belongs to a E-UTRA band listed in *supportedBandListEUTRA* except for the FR2 inter-RAT measurement which depends on the support of *independentGapConfig*. | | - |
| ***bandListEUTRA***  One entry corresponding to each supported E‑UTRA band listed in the same order as in *supportedBandListEUTRA*. | | - |
| ***bandParameterList-v1380***  If included, the UE shall include the same number of entries listed in the same order as the band entries in the corresponding band combination. | | - |
| ***bandParametersUL, bandParametersDL***  Indicates the supported parameters for the band. Each of *CA-MIMO-ParametersUL* and *CA-MIMO-ParametersDL* can be included only once for one band in a single band combination entry. | | - |
| ***beamformed (in MIMO-CA-ParametersPerBoBCPerTM)***  If signalled, the field indicates for a particular transmission mode, the UE capabilities concerning beamformed EBF/ FD-MIMO operation (class B) applicable for the concerned band combination. | | - |
| ***beamformed (in MIMO-UE-ParametersPerTM)***  Indicates for a particular transmission mode, the UE capabilities concerning beamformed EBF/ FD-MIMO operation (class B) applicable for band combinations for which the concerned capabilities are not signalled. | | Yes |
| ***benefitsFromInterruption***  Indicates whether the UE power consumption would benefit from being allowed to cause interruptions to serving cells when performing measurements of deactivated SCell carriers for *measCycleSCell* of less than 640ms, as specified in TS 36.133 [16]. | | No |
| ***bwPrefInd***  Indicates whether the UE supports maximum PDSCH/PUSCH bandwidth preference indication. | | - |
| ***ca-BandwidthClass***  The CA bandwidth class supported by the UE as defined in TS 36.101 [42], Table 5.6A-1.  The UE explicitly includes all the supported CA bandwidth class combinations in the band combination signalling. Support for one CA bandwidth class does not implicitly indicate support for another CA bandwidth class. | | - |
| ***ca-IdleModeMeasurements***  Indicates whether UE supports reporting measurements performed during RRC\_IDLE. | | - |
| ***ca-IdleModeValidityArea***  Indicates whether UE supports validity area for IDLE measurements during RRC\_IDLE. | | - |
| ***cch-IM-RefRecTypeA-OneRX-Port***  This field defines whether the DL Category 1bis or the DL Category M2 UE supports Type A downlink control channel interference mitigation (CCH-IM) receiver "LMMSE-IRC + CRS-IC" for PDCCH/PCFICH/PHICH/EPDCCH receive processing (Enhanced downlink control channel performance requirements Type A in TS 36.101 [6]). | | No |
| ***cch-InterfMitigation-RefRecTypeA, cch-InterfMitigation-RefRecTypeB, cch-InterfMitigation-MaxNumCCs***  The field *cch-InterfMitigation-RefRecTypeA* defines whether the UE supports Type A downlink control channel interference mitigation (CCH-IM) receiver "LMMSE-IRC + CRS-IC" for PDCCH/PCFICH/PHICH/EPDCCH receive processing (Enhanced downlink control channel performance requirements Type A in the TS 36.101 [6]). The field *cch-InterfMitigation-RefRecTypeB* defines whether the UE supports Type B downlink CCH-IM receiver "E-LMMSE-IRC + CRS-IC" for PDCCH/PCFICH/PHICH receive processing in synchronous networks (Enhanced downlink control channel performance requirements Type B in the TS 36.101 [6]). The UE supporting the capability defined by *cch-InterfMitigation-RefRecTypeB-r13* shall also support the capability defined by *cch-InterfMitigation-RefRecTypeA-r13*.  If the UE sets one or more of the fields *cch-InterfMitigation-RefRecTypeA* and *cch-InterfMitigation-RefRecTypeB* to "supported", the UE shall include the parameter *cch-InterfMitigation-MaxNumCCs* to indicate that the UE supports CCH-IM on at least one arbitrary downlink CC for up to *cch-InterfMitigation-MaxNumCCs* downlink CC CA configuration. The UE shall not include the parameter *cch-InterfMitigation-MaxNumCCs* if neither *cch-InterfMitigation-RefRecTypeA* nor *cch-InterfMitigation-RefRecTypeB* is present. The UE may not perform CCH-IM on more than 1 DL CCs. For example, the UE sets "*cch-InterfMitigation-MaxNumCCs* = 3"to indicate that UE supports CCH-IM on at least one DL CC for supported non-CA, 2DL CA and 3DL CA configurations. For CA scenarios, the CCH-IM is guaranteed to be supported on at least one arbitrary component carrier. | | - |
| ***cdma2000-NW-Sharing***  Indicates whether the UE supports network sharing for CDMA2000. | | - |
| ***ce-ClosedLoopTxAntennaSelection***  Indicates whether the UE supports UL closed-loop Tx antenna selection in CE mode A, as specified in TS 36.212 [22]. | | Yes |
| ***ce-CQI-AlternativeTable***  Indicates whether the UE supports alternative CQI table in CE mode A. See TS 36.213 [22]. | | Yes |
| ***ce-CRS-IntfMitig***  Indicates whether UE supports CRS interference mitigation, i.e., value *supported* indicates UE does not rely on the CRS outside certain PRBs and subframes as defined in TS 36.133 [16], clauses 3.6.1.2 and 3.6.1.3, and TS 36.213 [23] when operating in coverage enhancement mode. | | Yes |
| ***ce-CSI-RS-Feedback***  Indicates whether the UE supports CSI-RS based feedback when the UE is operating in CE mode A, as specified in TS 36.213 [23]. | | Yes |
| ***ce-CSI-RS-FeedbackCodebookRestriction***  Indicates whether the UE supports CSI-RS based feedback with codebook subset restriction when the UE in CE is operating in CE mode A, as specified in TS 36.213 [23]. | | Yes |
| ***ce-DL-ChannelQualityReporting***  Indicates whether UE operating in CE mode supports aperiodic DL channel quality reporting in RRC\_CONNECTED. | | Yes |
| ***ce-EUTRA-5GC***  Indicates whether the UE operating in CE mode A or B supports E-UTRA/5GC. | | Yes |
| ***ce-EUTRA-5GC-HO-ToNR-FDD-FR1***  Indicates whether the UE operating in CE mode A or B supports handover from E-UTRA/5GC to NR FDD FR1. | | Yes |
| ***ce-EUTRA-5GC-HO-ToNR-TDD-FR1***  Indicates whether the UE operating in CE mode A or B supports handover from E-UTRA/5GC to NR TDD FR1. | | Yes |
| ***ce-EUTRA-5GC-HO-ToNR-FDD-FR2***  Indicates whether the UE operating in CE mode A or B supports handover from E-UTRA/5GC to NR FDD FR2. | | Yes |
| ***ce-EUTRA-5GC-HO-ToNR-TDD-FR2***  Indicates whether the UE operating in CE mode A or B supports handover from E-UTRA/5GC to NR TDD FR2-1 as specified in TS 38.101-x [xx]. | | Yes |
| ***ce-EUTRA-5GC-HO-ToNR-TDD-FR2-2***  Indicates whether the UE operating in CE mode A or B supports handover from E-UTRA/5GC to NR TDD FR2-2 as specified in TS 38.101-x [xx]. | | - |
| ***ce-HARQ-AckBundling***  Indicates whether the UE supports HARQ-ACK bundling in half duplex FDD in CE mode A, as specified in TS 36.212 [22] and TS 36.213 [23]. | | - |
| ***ce-InactiveState***  Indicates whether UE operating in CE mode supports RRC\_INACTIVE when connected to 5GC. A UE including this field also supports short eDRX cycles in RRC\_INACTIVE when connected to 5GC. | | No |
| ***ce-MeasRSS-Dedicated, ce-MeasRSS-DedicatedSameRBs***  Indicates whether the UE operating in CE mode A/B supports receiving neighbour cell RSS information in dedicated signalling and performing serving cell and neighbour cell measurements based on RSS in RRC\_CONNECTED as specified in TS 36.306 [5] and TS 36.133 [16]. | | Yes |
| ***ce-ModeA, ce-ModeB***  Indicates whether the UE supports operation in CE mode A and/or B, as specified in TS 36.211 [21] and TS 36.213 [23]. | | - |
| ***crs-ChEstMPDCCH-CE-ModeA, crs-ChEstMPDCCH-CE-ModeB***  Indicates whether UE operating in CE mode A/B supports using CRS for improving MPDCCH channel estimation. | | Yes |
| ***crs-ChEstMPDCCH-CSI***  Indicates whether UE operating in CE mode A supports CSI-based mapping for improving MPDCCH channel estimation. | | Yes |
| ***crs-ChEstMPDCCH-ReciprocityTDD***  Indicates whether UE operating in CE mode A supports using CRS for improving MPDCCH channel estimation with reciprocity-based candidates in TDD. | | No |
| ***ceMeasurements***  Indicates whether the UE supports intra-frequency RSRQ measurements and inter-frequency RSRP and RSRQ measurements in RRC\_CONNECTED, as specified in TS 36.133 [16] and TS 36.304 [4]. | | - |
| ***ce-MultiTB-64QAM***  Indicates whether the UE supports downlink 64QAM for multiple TB scheduling in connected mode for PDSCH when operating in CE mode A, as specified in TS 36.211 [21] and TS 36.213 [23]. This field can be included only if *ce-PUSCH-SubPRB-Allocation* is included. | | Yes |
| ***ce-MultiTB-EarlyTermination***  Indicates whether the UE supports early termination of PUSCH transmission for multiple TB scheduling in connected mode, as specified in TS 36.211 [21] and TS 36.213 [23]. | | Yes |
| ***ce-MultiTB-FrequencyHopping***  Indicates whether the UE supports frequency hopping for multiple TB scheduling for PDSCH/PUSCH in connected mode, as specified in TS 36.211 [21] and TS 36.213 [23]. | | Yes |
| ***ce-MultiTB-HARQ-AckBundling***  Indicates whether the UE supports downlink HARQ-ACK bundling for multiple TB scheduling in connected mode when operating in CE mode A, as specified in TS 36.211 [21] and TS 36.213 [23]. | | Yes |
| ***ce-MultiTB-Interleaving***  Indicates whether the UE supports TB interleaving for multiple TB scheduling in connected mode for PDSCH/PUSCH when operating in CE mode A or B, as specified in TS 36.211 [21] and TS 36.213 [23]. | | Yes |
| ***ce-MultiTB-SubPRB***  Indicates whether the UE supports sub-PRB allocation for multiple TB scheduling for PUSCH in connected mode, as specified in TS 36.211 [21] and TS 36.213 [23]. This field can be included only if *ce-PUSCH-SubPRB-Allocation* is included. | | Yes |
| ***ce-PDSCH-14HARQProcesses, ce-PDSCH-14HARQProcesses-Alt2***  Indicates whether the UE supports 14-HARQ processes, as specified in TS 36.212 [22]. | | - |
| ***ce-PDSCH-64QAM***  Indicates whether the UE supports 64QAM for non-repeated unicast PDSCH in CE mode A. | | Yes |
| ***ce-PDSCH-FlexibleStartPRB-CE-ModeA*, *ce-PDSCH-FlexibleStartPRB-CE-ModeB*,**  ***ce-PUSCH-FlexibleStartPRB-CE-ModeA*, *ce-PUSCH-FlexibleStartPRB-CE-ModeB***  This field indicates whether UE supports flexible starting PRB for PDSCH/PUSCH when operating in coverage enhancement mode A/B, as specified in TS 36.211 [21] and TS 36.213 [22]. | | Yes |
| ***ce-PDSCH-MaxTBS***  Indicates whether the UE supports downlink TBS of 1736 bits, as specified in TS 36.212 [22]. | | - |
| ***ce-PDSCH-PUSCH-Enhancement***  Indicates whether the UE supports new numbers of repetitions for PUSCH and modulation restrictions for PDSCH/PUSCH in CE mode A as specified in TS 36.212 [22] and TS 36.213 [23]. | | No |
| ***ce-PDSCH-PUSCH-MaxBandwidth***  Indicates the maximum supported PDSCH/PUSCH channel bandwidth in CE mode A and B, as specified in TS 36.212 [22] and TS 36.213 [23]. Value bw5 corresponds to 5 MHz and value bw20 corresponds to 20 MHz. If the field is absent the maximum PDSCH/PUSCH channel bandwidth in CE mode A and B is 1.4 MHz. If the setting of this parameter is 20 MHz, the max supported PUSCH channel bandwidth in CE mode A is 5 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. | | Yes |
| ***ce-PDSCH-TenProcesses***  Indicates whether the UE supports 10 DL HARQ processes in FDD in CE mode A. | | Yes |
| ***ce-PUCCH-Enhancement***  Indicates whether the UE supports repetition levels 64 and 128 for PUCCH in CE Mode B, as specified in TS 36.211 [21] and in TS 36.213 [23]. | | No |
| ***ce-PUSCH-NB-MaxTBS***  Indicates whether the UE supports 2984 bits max UL TBS in 1.4 MHz in CE mode A operation, as specified in TS 36.212 [22] and TS 36.213 [23]. | | Yes |
| ***ce-PUSCH-SubPRB-Allocation***  Indicates whether the UE supports sub-PRB resource allocation for PUSCH in CE mode A or B, as specified in TS 36.211 [21], TS 36.212 [22] and TS 36.213 [23]. | | Yes |
| ***ce-RetuningSymbols***  Indicates the number of retuning symbols in CE mode A and B as specified in TS 36.211 [21]. Value n0 corresponds to 0 retuning symbols and value n1 corresponds to 1 retuning symbol. If the field is absent the number of retuning symbols in CE mode A and B is 2. | | No |
| ***ce-SchedulingEnhancement***  Indicates whether the UE supports dynamic HARQ-ACK delay for HD-FDD in CE mode A as specified in TS 36.212 [22] and TS 36.213 [23]. | | No |
| ***ce-SRS-Enhancement***  Indicates whether the UE supports SRS coverage enhancement in TDD with support of SRS combs 2 and 4 as specified in TS 36.213 [23]. This field can be included only if *ce-SRS-EnhancementWithoutComb4* is not included. | | Yes |
| ***ce-SRS-EnhancementWithoutComb4***  Indicates whether the UE supports SRS coverage enhancement in TDD with support of SRS comb 2 but without support of SRS comb 4 as specified in TS 36.213 [23]. This field can be included only if *ce-SRS-Enhancement* is not included. | | - |
| ***ce-SwitchWithoutHO***  Indicates whether the UE supports switching between normal mode and enhanced coverage mode without handover. | | - |
| ***ce-UL-HARQ-ACK-Feedback***  This field indicates whether UE supports uplink HARQ ACK feedback when operating in coverage enhancement, as specified in TS36.213 [22]. | | Yes |
| ***channelMeasRestriction***  Indicates for a particular transmission mode whether the UE supports channel measurement restriction. | | Yes |
| ***cho***  Indicates whether the UE supports conditional handover including execution condition, candidate cell configuration and maximum 8 candidate cells. | | Yes |
| ***cho-Failure***  Indicates whether the UE supports conditional handover during re-establishment procedure when the selected cell is configured as candidate cell for condition handover. | | Yes |
| ***cho-FDD-TDD***  Indicates whether the UE supports conditional handover between FDD and TDD cells. | | No |
| ***cho-TwoTriggerEvents***  Indicates whether the UE supports 2 trigger events for same execution condition. It is mandatory supported if the UE suppors *cho*. | | Yes |
| ***codebook-HARQ-ACK***  Indicates whether the UE supports determining HARQ ACK codebook size based on the DAI-ased solution and/or the number of configured CCs. The first bit is set to "1" if the UE supports the DAI-based codebook size determination. The second bit is set to "1" if the UE supports the codebook determination based on the number of configured CCs. | | No |
| ***commMultipleTx***  Indicates whether the UE supports multiple transmissions of sidelink communication to different destinations in one SC period. If *commMultipleTx-r13* is set to supported then the UE support 8 transmitting sidelink processes. | | - |
| ***commSimultaneousTx***  Indicates whether the UE supports simultaneous transmission of EUTRA and sidelink communication (on different carriers) in all bands for which the UE indicated sidelink support in a band combination (using *commSupportedBandsPerBC*). | | - |
| ***commSupportedBands***  Indicates the bands on which the UE supports sidelink communication, by an independent list of bands i.e. separate from the list of supported E-UTRA band, as indicated in *supportedBandListEUTRA*. | | - |
| ***commSupportedBandsPerBC***  Indicates, for a particular band combination, the bands on which the UE supports simultaneous reception of EUTRA and sidelink communication. If the UE indicates support simultaneous transmission (using *commSimultaneousTx*), it also indicates, for a particular band combination, the bands on which the UE supports simultaneous transmission of EUTRA and sidelink communication. The first bit refers to the first band included in *commSupportedBands*, with value 1 indicating sidelink is supported. | | - |
| ***configN (in MIMO-CA-ParametersPerBoBCPerTM)***  If signalled, the field indicates for a particular transmission mode whether the UE supports non-precoded EBF/ FD-MIMO (class A) related configuration N for the concerned band combination. | | - |
| ***configN (in MIMO-UE-ParametersPerTM)***  Indicates for a particular transmission mode whether the UE supports non-precoded EBF/ FD-MIMO (class A) related configuration N for band combinations for which the concerned capabilities are not signalled. | | Yes |
| ***continueEHC-Context***  Indicates that the UE supports EHC context continuation operation where the UE keeps the established EHC context(s) upon PDCP re-establishment, as specified in TS 36.323 [8]. | | No |
| ***crossCarrierScheduling*** | | Yes |
| ***crossCarrierScheduling-B5C***  Indicates whether the UE supports cross carrier scheduling beyond 5 DL CCs. | | No |
| ***crossCarrierSchedulingLAA-DL***  Indicates whether the UE supports cross-carrier scheduling from a licensed carrier for LAA cell(s) for downlink. This field can be included only if *downlinkLAA* is included. | | - |
| ***crossCarrierSchedulingLAA-UL***  Indicates whether the UE supports cross-carrier scheduling from a licensed carrier for LAA cell(s) for uplink. This field can be included only if *uplinkLAA* is included. | | - |
| ***crs-DiscoverySignalsMeas***  Indicates whether the UE supports CRS based discovery signals measurement, and PDSCH/EPDCCH RE mapping with zero power CSI-RS configured for discovery signals. | | Yes |
| ***crs-IM-TM1-toTM9-OneRX-Port***  Indicates whether the DL Cateogry 1bis UE ot the DL Category M2 UE supports CRS interference mitigation (IM) while operating in the following transmission modes (TM): TM 1, TM 2, …, TM 8 and TM 9. | | No |
| ***crs-InterfHandl***  Indicates whether the UE supports CRS interference handling. | | Yes |
| ***crs-InterfMitigationTM10***  The field defines whether the UE supports CRS interference mitigation in transmission mode 10. The UE supporting the *crs-InterfMitigationTM10* capability shall also support the *crs-InterfHandl* capability. | | No |
| ***crs-InterfMitigationTM1toTM9***  Indicates whether the UE supports CRS interference mitigation (IM) while operating in the following transmission modes (TM): TM 1, TM 2, …, TM 8 and TM 9. The UE shall not include the field if it does not support CRS IM in TMs 1-9. If the field is present, the UE supports CRS-IM on at least one arbitrary downlink CC for up to *crs-InterfMitigationTM1toTM9-r13* downlink CC CA configuration. The UE signals *crs-InterfMitigationTM1toTM9-r13* value to indicate the maximum *crs-InterfMitigationTM1toTM9-r13* downlink CC CA configuration where UE may apply CRS IM. For example, the UE sets "*crs-InterfMitigationTM1toTM9-r13* = 3" to indicate that the UE supports CRS-IM on at least one DL CC for supported non-CA, 2DL CA and 3DL CA configurations. The UE supporting the *crs-InterfMitigationTM1toTM9-r13* capability shall also support the *crs-InterfHandl-r11* capability. | | - |
| ***crs-IntfMitig***  Indicate whether the UE supports CRS interference mitigation as specified in TS 36.133 [16], clause 3.6.1.1. | | Yes |
| ***crs-LessDwPTS***  Indicates whether the UE supports TDD special subframe configuration 10 without CRS transmission on the 5th symbol of DwPTS, i.e. *ssp10-CRS-LessDwPTS*, as specified in TS 36.211 [17]*.* | | - |
| ***csi-ReportingAdvanced, csi-ReportingAdvancedMaxPorts (in MIMO-CA-ParametersPerBoBCPerTM)***  If signalled, the field indicates that for a particular transmission mode, the maximum number of CSI-RS ports supported by the UE for advanced CSI reporting is different in the concerned band of band combination than the value indicated by the field *csi-ReportingAdvanced* or *csi-ReportingAdvancedMaxPorts* in *MIMO-UE-ParametersPerTM*. The UE shall not include both *csi-ReportingAdvanced* and *csi-ReportingAdvancedMaxPorts* for a particular transmission mode in the concerned band of band combination. | | - |
| ***csi-ReportingAdvanced (in MIMO-UE-ParametersPerTM)***  Indicates for a particular transmission mode the maximum number of CSI-RS ports supported by the UE for advanced CSI reporting. The field *csi-ReportingAdvanced* indicates 32 CSI-RS ports. The UE shall not include both *csi-ReportingAdvanced* and *csi-ReportingAdvancedMaxPorts* for a particular transmission mode. | | Yes |
| ***csi-ReportingAdvancedMaxPorts (in MIMO-UE-ParametersPerTM)***  Indicates for a particular transmission mode the maximum number of CSI-RS ports supported by the UE for advanced CSI reporting. The field *csi-ReportingAdvancedMaxPorts* indicates 8, 12, 16, 20, 24 or 28 CSI-RS ports. The UE shall not include both *csi-ReportingAdvanced* and *csi-ReportingAdvancedMaxPorts* for a particular transmission mode. | | - |
| ***csi-ReportingNP (in MIMO-CA-ParametersPerBoBCPerTM)***  If signalled, value *different* indicates that for a particular transmission mode, the CSI reporting on non-precoded CSI-RS with 20, 24, 28 or 32 antenna ports for the concerned band of band combination is different than the value indicated by field *csi-ReportingNP* in *MIMO-UE-ParametersPerTM*. | | - |
| ***csi-ReportingNP (in MIMO-UE-ParametersPerTM)***  Indicates for a particular transmission mode whether the UE supports CSI reporting on non-precoded CSI-RS with 20, 24, 28, or 32 antenna ports for band combinations for which the concerned capabilities are not signalled in *MIMO-CA-ParametersPerBoBCPerTM*, and the FD-MIMO processing capability condition as described in NOTE 8 is satisfied. | | Yes |
| ***csi-RS-DiscoverySignalsMeas***  Indicates whether the UE supports CSI-RS based discovery signals measurement. If this field is included, the UE shall also include *crs-DiscoverySignalsMeas*. | | Yes |
| ***csi-RS-DRS-RRM-MeasurementsLAA***  Indicates whether the UE supports performing RRM measurements on LAA cell(s) based on CSI-RS-based DRS. This field can be included only if *downlinkLAA* is included. | | - |
| ***csi-RS-EnhancementsTDD***  Indicates for a particular transmission mode whether the UE supports CSI-RS enhancements applicable for TDD. | | Yes |
| ***csi-SubframeSet***  Indicates whether the UE supports REL-12 DL CSI subframe set configuration, REL-12 DL CSI subframe set dependent CSI measurement/feedback, configuration of up to 2 CSI-IM resources for a CSI process with no more than 4 CSI-IM resources for all CSI processes of one frequency if the UE supports tm10, configuration of two ZP-CSI-RS for tm1 to tm9, PDSCH RE mapping with two ZP-CSI-RS configurations, and EPDCCH RE mapping with two ZP-CSI-RS configurations if the UE supports EPDCCH. This field is only applicable for UEs supporting TDD. | | Yes |
| ***dataInactMon***  Indicates whether the UE supports the data inactivity monitoring as specified in TS 36.321 [6]. | | - |
| ***dc-Support***  Including this field indicates that the UE supports synchronous DC and power control mode 1. Including this field for a band combination entry comprising of single band entry indicates that the UE supports intra-band contiguous DC. Including this field for a band combination entry comprising of two or more band entries, indicates that the UE supports DC for these bands and that the serving cells corresponding to a band entry shall belong to one cell group (i.e. MCG or SCG). Including field *asynchronous* indicates that the UE supports asynchronous DC and power control mode 2. Including this field for a TDD/FDD band combination indicates that the UE supports TDD/FDD DC for this band combination. | | - |
| ***delayBudgetReporting***  Indicates whether the UE supports delay budget reporting. | | No |
| ***demodulationEnhancements***  This field defines whether the UE supports advanced receiver in SFN scenario (350 km/h) as specified in TS 36.101 [42]. | | - |
| ***demodulationEnhancements2***  This field defines whether the UE supports further enhanced receiver in HST-SFN scenario (up to 500 km/h velocity) as specified in TS 36.101 [42]. | | - |
| ***densityReductionNP, densityReductionBF***  Indicates whether the UE supports CSI-RS density reduction with values 1, 1/2 and 1/3 for non-precoded CSI-RS and beamformed CSI-RS respectively. | | Yes |
| ***deviceType***  UE may set the value to "*noBenFromBatConsumpOpt*" when it does not foresee to particularly benefit from NW-based battery consumption optimisation. Absence of this value means that the device does benefit from NW-based battery consumption optimisation. | | - |
| ***diffFallbackCombReport***  Indicates that the UE supports reporting of UE radio access capabilities for the CA band combinations asked by the eNB as well as, if any, reporting of different UE radio access capabilities for their fallback band combination as specified in TS 36.306 [5]. The UE does not report fallback combinations if their UE radio access capabilities are the same as the ones for the CA band combination asked by the eNB. | | - |
| ***differentFallbackSupported***  Indicates that the UE supports different capabilities for at least one fallback case of this band combination. | | - |
| ***directMCG-SCellActivationResume***  Indicates whether the UE supports having an E-UTRA MCG SCell configured in activated SCell state. | | - |
| ***directSCellActivation***  Indicates whether the UE supports having an E-UTRA SCell configured in activated SCell state in the *RRCConnectionReconfiguration* message. This field is applicable to both LTE standalone and LTE-DC. | | - |
| ***directSCellHibernation***  Indicates whether the UE supports having an SCell configured in dormant SCell state. | | - |
| ***directSCG-SCellActivationNEDC***  Indicates whether the UE supports having an E-UTRA SCG SCell configured in activated SCell state in the *RRCConnectionReconfiguration* message contained in the NR *RRCReconfiguration* message, as defined in TS 36.321 [6] and TS 38.331 [82].  If the UE indicates support of *directSCG-SCellActivationNEDC-r16*, the UE shall also indicate support of *ne-dc* as specified in TS 38.331 [82]. | | - |
| ***directSCG-SCellActivationResume***  Indicates whether the UE supports having an E-UTRA SCG SCell configured in activated SCell state. | | - |
| ***discInterFreqTx***  Indicates whether the UE support sidelink discovery announcements either a) on the primary frequency only or b) on other frequencies also, regardless of the UE configuration (e.g. CA, DC). The UE may set discInterFreqTx to supported when having a separate transmitter or if it can request sidelink discovery transmission gaps. | | - |
| ***discoverySignalsInDeactSCell***  Indicates whether the UE supports the behaviour on DL signals and physical channels when SCell is deactivated and discovery signals measurement is configured as specified in TS 36.211 [21], clause 6.11A. This field is included only if UE supports carrier aggregation and includes *crs-DiscoverySignalsMeas*. | | Yes |
| ***discPeriodicSLSS***  Indicates whether the UE supports periodic (i.e. not just one time before sidelink discovery announcement) Sidelink Synchronization Signal (SLSS) transmission and reception for sidelink discovery. | | - |
| ***discScheduledResourceAlloc***  Indicates whether the UE supports transmission of discovery announcements based on network scheduled resource allocation. | | - |
| ***disc-UE-SelectedResourceAlloc***  Indicates whether the UE supports transmission of discovery announcements based on UE autonomous resource selection. | | - |
| ***disc***-***SLSS***  Indicates whether the UE supports Sidelink Synchronization Signal (SLSS) transmission and reception for sidelink discovery. | | - |
| ***discSupportedBands***  Indicates the bands on which the UE supports sidelink discovery. One entry corresponding to each supported E-UTRA band, listed in the same order as in *supportedBandListEUTRA*. | | - |
| ***discSupportedProc***  Indicates the number of processes supported by the UE for sidelink discovery. | | - |
| ***discSysInfoReporting***  Indicates whether the UE supports reporting of system information for inter-frequency/PLMN sidelink discovery. | | - |
| ***dl-256QAM***  Indicates whether the UE supports 256QAM in DL on the band. | | - |
| ***dl-1024QAM***  Indicates whether the UE supports 1024QAM in DL on the band or on the band within the band combination. When *dl-1024QAM-ScalingFactor* and *dl-1024QAM-TotalWeightedLayers* are included, the UE supports 1024QAM in a set of CCs in a band combination if the CCs belong to bands indicated to support 1024QAM in that band combination and the 1024QAM processing capability condition as specified in equation 4.3.5.31-1 in TS 36.306 [5] is satisfied. | | - |
| ***dl-1024QAM-ScalingFactor***  Indicates scaling factor for processing a CC configured with 1024QAM with respect to a CC not configured with 1024QAM as described in 4.3.5.31 in TS 36.306 [5]. Value *v1* indicates 1, value *v1dot2* indicates 1.2 and value *v1dot25* indicates 1.25. | | - |
| ***dl-1024QAM-TotalWeightedLayers***  Indicates total number of weighted layers the UE can process for 1024QAM as described in 4.3.5.31 in TS 36.306 [5]. Actual value = (10 + indicated value x 2), i.e., value 0 indicates 10 layers, value 1 indicates 12 layers and so on. | | - |
| ***dl-1024QAM-Slot***  Indicates whether the UE supports 1024QAM in DL on the band for slot TTI operation. | | - |
| ***dl-1024QAM-SubslotTA-1***  Indicates whether the UE supports 1024QAM in DL on the band for subslot TTI operation with TA set 1. | | - |
| ***dl-1024QAM-SubslotTA-2***  Indicates whether the UE supports 1024QAM in DL on the band for subslot TTI operation with TA set 2, dmrsBasedSPDCCH-nonMBSFN | | - |
| ***dl-DedicatedMessageSegmentation***  Indicates whether the UE supports reception of segmented DL RRC messages. | | - |
| ***dmrs-BasedSPDCCH-MBSFN***  Indicates whether the UE supports sDCI monitoring in DMRS based SPDCCH for MBSFN subframe. If UE supports this, it also provides the corresponding DMRS based SPDCCH capability in *min-Proc-TimelineSubslot.* | | Yes |
| ***dmrs-BasedSPDCCH-nonMBSFN***  Indicates whether the UE supports sDCI monitoring in DMRS based SPDCCH for non-MBSFN subframe. If UE supports this, it also provides the corresponding DMRS based SPDCCH capability in *min-Proc-TimelineSubslot.* | | Yes |
| ***dmrs-Enhancements (in MIMO-CA-ParametersPerBoBCPerTM)***  If signalled, the field indicates for a particular transmission mode, that for the concerned band combination the DMRS enhancements are different than the value indicated by field *dmrs-Enhancements* in *MIMO-UE-ParametersPerTM*. | | - |
| ***dmrs-Enhancements (in MIMO-UE-ParametersPerTM)***  Indicates for a particular transmission mode whether the UE supports DMRS enhancements for the indicated transmission mode. | | Yes |
| ***dmrs-LessUpPTS***  Indicates whether the UE supports not to transmit DMRS for PUSCH in UpPTS. | | No |
| ***dmrs-OverheadReduction***  Indicates whether the UE supports OCC4 for rank 3 and 4 transmission as specified in clause 5.3.3.1.5C of TS 36.212 [22]. | | Yes |
| ***dmrs-PositionPattern***  Indicates whether the UE supports uplink DMRS position pattern 'D D D' in subslot #5 with application of the 1/6 as the TBS scaling factor. | | Yes |
| ***dmrs-RepetitionSubslotPDSCH***  Indicates whether the UE supports back-to-back 3/4-layer DMRS reception in two consecutive subslots across subframe boundary for subslot-PDSCH. | | Yes |
| ***dmrs-SharingSubslotPDSCH***  Indicates whether the UE supports DMRS sharing in two consecutive subslots across subframe boundary for subslot-PDSCH. | | Yes |
| ***dormantSCellState***  Indicates whether UE supports Dormant SCell state (i.e. SCell state with CQI and RRM measurement reporting but no PDCCH monitoring). | | - |
| ***downlinkLAA***  Presence of the field indicates that the UE supports downlink LAA operation including identification of downlink transmissions on LAA cell(s) for full downlink subframes, decoding of common downlink control signalling on LAA cell(s), CSI feedback for LAA cell(s), RRM measurements on LAA cell(s) based on CRS-based DRS. | | - |
| ***drb-TypeSCG***  Indicates whether the UE supports SCG bearer. | | - |
| ***drb-TypeSplit***  Indicates whether the UE supports split bearer except for PDCP data transfer in UL. | | - |
| ***dtm***  Indicates whether the UE supports DTM in GERAN. | | - |
| ***dummy***  This field is not used in the specification. It shall not be sent by the UE. | | - |
| ***earlyData-UP***  Indicates whether the UE supports UP-EDT when connected to EPC. | | - |
| ***earlyData-UP-5GC***  Indicates whether the UE supports UP-EDT when connected to 5GC. | | - |
| ***earlySecurityReactivation***  Indicates whether the UE supports early security reactivation when resuming a suspended RRC connection. | | - |
| ***e-CSFB-1XRTT***  Indicates whether the UE supports enhanced CS fallback to CDMA2000 1xRTT or not. | | Yes |
| ***e-CSFB-ConcPS-Mob1XRTT***  Indicates whether the UE supports concurrent enhanced CS fallback to CDMA2000 1xRTT and PS handover/ redirection to CDMA2000 HRPD. | | Yes |
| ***e-CSFB-dual-1XRTT***  Indicates whether the UE supports enhanced CS fallback to CDMA2000 1xRTT for dual Rx/Tx configuration. This bit can only be set to supported if *tx-Config1XRTT* and *rx-Config1XRTT* are both set to dual. | | Yes |
| ***e-HARQ-Pattern-FDD***  Indicates whether the UE supports enhanced HARQ pattern for TTI bundling operation for FDD. | | Yes |
| ***ehc***  Indicates that the UE supports Ethernet header compression and decompression using EHC protocol, as specified in TS 36.323 [8] and in Annex A of TS 38.323 [83]. The UE indicating this capability and indicating support for at least one ROHC profile, shall support simultaneous configuration of EHC and ROHC on different DRBs. | | No |
| ***eLCID-Support***  Indicates whether the UE supports LCID "10000" and MAC PDU subheader containing the eLCID field as described in TS 36.321 [6]. | | - |
| ***emptyUnicastRegion***  Indicates whether the UE supports unicast reception in subframes with empty unicast control region as described in TS 36.213 [23] clause 12. This field can be included only if *unicast-fembmsMixedSCell* and *crossCarrierScheduling* are included. | | No |
| ***en-DC***  Indicates whether the UE supports EN-DC. | | - |
| ***endingDwPTS***  Indicates whether the UE supports reception ending with a subframe occupied for a DwPTS-duration as described in TS 36.211 [21] and TS 36.213 [23]. This field can be included only if *downlinkLAA* is included. | | - |
| ***Enhanced-4TxCodebook***  Indicates whether the UE supports enhanced 4Tx codebook*.* | | No |
| ***enhancedDualLayerTDD***  Indicates whether the UE supports enhanced dual layer (PDSCH transmission mode 8) for TDD or not. | | - |
| ***ePDCCH***  Indicates whether the UE can receive DCI on UE specific search space on Enhanced PDCCH. | | Yes |
| ***epdcch-SPT-differentCells***  Indicates whether the UE supports EPDCCH and short processing time on different serving cells. | | Yes |
| ***epdcch-STTI-differentCells***  Indicates whether the UE supports EPDCCH and sTTI on different serving cells. | | Yes |
| ***e-RedirectionUTRA*** | | Yes |
| ***e-RedirectionUTRA-TDD***  Indicates whether the UE supports enhanced redirection to UTRA TDD to multiple carrier frequencies both with and without using related SIB provided by *RRCConnectionRelease* or not. | | Yes |
| ***etws-CMAS-RxInConnCE-ModeA, etws-CMAS-RxInConn***  Indicates whether the UE operating in CE mode A/B supports reception of ETWS/CMAS indication in RRC\_CONNECTED mode as specified in TS 36.212 [22]. | | - |
| ***eutra-5GC***  Indicates whether the UE supports E-UTRA/5GC. | | Yes |
| ***eutra-5GC-HO-ToNR-FDD-FR1***  Indicates whether the UE supports handover from E-UTRA/5GC to NR FDD FR1. | | Yes |
| ***eutra-5GC-HO-ToNR-TDD-FR1***  Indicates whether the UE supports handover from E-UTRA/5GC to NR TDD FR1. | | Yes |
| ***eutra-5GC-HO-ToNR-FDD-FR2***  Indicates whether the UE supports handover from E-UTRA/5GC to NR FDD FR2. | | Yes |
| ***eutra-5GC-HO-ToNR-TDD-FR2***  Indicates whether the UE supports handover from E-UTRA/5GC to NR TDD FR2-1 as specified in TS 38.101-x [xx]. | | Yes |
| ***eutra-5GC-HO-ToNR-TDD-FR2-2***  Indicates whether the UE supports handover from E-UTRA/5GC to NR TDD FR2-2 as specified in TS 38.101-x [xx]. | | - |
| ***eutra-CGI-Reporting-ENDC***  Indicates whether the UE supports Intra-RAT report CGI procedure when it is configured with (NG) EN-DC wherein either MN and SN have different DRX cycles, or on-duration configured by MN does not contain on-duration configured by SN if their DRX cycles are same. | | Yes |
| ***eutra-CGI-Reporting-NEDC***  Indicates whether the UE supports acquisition of relevant information from a neighbouring E-UTRA cell by reading the SI of the neighbouring cell and reporting the acquired information to the network when the NE-DC is configured. | | Yes |
| ***eutra-EPC-HO-ToNR-FDD-FR1***  Indicates whether the UE supports handover from E-UTRA/EPC to NR FDD FR1. | | Yes |
| ***eutra-EPC-HO-ToNR-TDD-FR1***  Indicates whether the UE supports handover from E-UTRA/EPC to NR TDD FR1. | | Yes |
| ***eutra-EPC-HO-ToNR-FDD-FR2***  Indicates whether the UE supports handover from E-UTRA/EPC to NR FDD FR2. | | Yes |
| ***eutra-EPC-HO-ToNR-TDD-FR2***  Indicates whether the UE supports handover from E-UTRA/EPC to NR TDD FR2-1 as specified in TS 38.101-x [xx]. | | Yes |
| ***eutra-EPC-HO-ToNR-TDD-FR2-2***  Indicates whether the UE supports handover from E-UTRA/EPC to NR TDD FR2-2 as specified in TS 38.101-x [xx]. | | - |
| ***eutra-EPC-HO-EUTRA-5GC***  Indicates whether the UE supports handover between E-UTRA/EPC and E-UTRA/5GC. | | Yes |
| ***eutra-IdleInactiveMeasurements***  Indicates whether UE supports reporting measurements performed during RRC\_IDLE or RRC\_INACTIVE. | | No |
| ***eutra-SI-AcquisitionForHO-ENDC***  Indicates whether the UE supports, upon configuration of *si-RequestForHO* by the network, acquisition of relevant information from a neighbouring E-UTRA cell by reading the SI of the neighbouring cell using autonomous gaps and reporting the acquired information to the network. | | Yes |
| ***eventB2***  Indicates whether the UE supports event B2. A UE supporting NR SA operation shall set this bit to *supported*. | | - |
| ***extendedBand-n77***  This field is only applicable for UEs that indicate support for band n77. If present, the UE supports the restriction to 3450 - 3550 MHz and 3700 - 3980 MHz ranges of band n77 in the USA as specified in Note 12 of Table 5.2-1 in TS 38.101-1 [85]. If absent, the UE supports only restriction to the 3700 - 3980 MHz range of band n77 in the USA. A UE that indicates this field shall support NS value 55 as specified in TS 38.101-1 [85]. | | - |
| ***extendedFreqPriorities***  Indicates whether the UE supports extended E-UTRA frequency priorities indicated by *cellReselectionSubPriority* field. A UE supporting NR SA operation shall set this bit to *supported*. | | - |
| ***extendedLCID-Duplication***  Indicates whether the UE supports use of extended LCIDs 32-38 for PDCP duplication. | | - |
| ***extendedLongDRX***  Indicates whether the UE supports extended long DRX cycle values of 5.12s and 10.24s in RRC\_CONNECTED. | | - |
| ***extendedMAC-LengthField***  Indicates whether the UE supports the MAC header with L field of size 16 bits as specified in TS 36.321 [6], clause 6.2.1. | | - |
| ***extendedMaxMeasId***  Indicates whether the UE supports extended number of measurement identies as defined by *maxMeasId-r12*. | | No |
| ***extendedMaxObjectId***  Indicates whether the UE supports extended number of measurement object identies as defined by *maxObjectId-r13*. | | No |
| ***extendedNumberOfDRBs***  Indicates whether the UE supports up to 15 DRBs. The UE shall support any combination of RLC AM and RLC UM entities for the configured DRBs. | | - |
| ***extendedPollByte***  Indicates whether the UE supports extended pollByte values as defined by *pollByte-r14*. | | - |
| ***extended-RLC-LI-Field***  Indicates whether the UE supports 15 bit RLC length indicator. | | - |
| ***extendedRLC-SN-SO-Field***  Indicates whether the UE supports 16 bits of RLC sequence number and segmentation offset. | | - |
| ***extendedRSRQ-LowerRange***  Indicates whether the UE supports the extended RSRQ lower value range from -34dB to -19.5dB in measurement configuration and reporting as specified in TS 36.133 [16]. | | No |
| ***fdd-HARQ-TimingTDD***  Indicates whether UE supports FDD HARQ timing for TDD SCell when configured with TDD PCell. | | Yes |
| ***featureGroupIndicators, featureGroupIndRel9Add, featureGroupIndRel10***  The definitions of the bits in the bit string are described in Annex B.1 (for *featureGroupIndicators* and *featureGroupIndRel9Add*) and in Annex C.1 (for *featureGroupIndRel10*). | | Yes |
| ***featureSetsDL-PerCC***  In MR-DC, indicates a set of features that the UE supports on one component carrier in a bandwidth class for a band in a given band combination. The UE shall hence include at least as many *FeatureSetDL-PerCC-Id* in this list as the number of carriers it supports according to the *ca-bandwidthClassDL*, except if indicating additional functionality by reducing the number of *FeatureSetDownlinkPerCC-Id* in the feature set. The order of the elements in this list is not relevant, i.e., the network may configure any of the carriers in accordance with any of the *FeatureSetDL-PerCC-Id* in this list. | | - |
| ***FeatureSetDL-PerCC-Id***  In MR-DC, indicates the index position of the *FeatureSetDL-PerCC-r15* in the *featureSetsDL-PerCC-r15* list. Value 0 corresponds to the first element in the list, value 1 corresponds to the second element in the list, and so on. Value 32 is not used. | | - |
| ***featureSetsUL-PerCC***  In MR-DC, indicates a set of features that the UE supports on one component carrier in a bandwidth class for a band in a given band combination. The UE shall hence include at least as many *FeatureSetUL-PerCC-Id* in this list as the number of carriers it supports according to the *ca-bandwidthClassUL*, except if indicating additional functionality by reducing the number of *FeatureSetDownlinkPerCC-Id* in the feature set. The order of the elements in this list is not relevant, i.e., the network may configure any of the carriers in accordance with any of the *FeatureSetUL-PerCC-Id* in this list. | | - |
| ***FeatureSetUL-PerCC-Id***  In MR-DC, indicates the index position of the *FeatureSetUL-PerCC-r15* in the *featureSetsUL-PerCC-r15* list. Value 0 corresponds to the first element in the list, value 1 corresponds to the second element in the list, and so on. Value 32 is not used. | | - |
| ***fembmsMixedCell***  Indicates whether the UE in RRC\_CONNECTED supports MBMS reception with 15 kHz subcarrier spacings via MBSFN from FeMBMS/Unicast mixed cells on a frequency indicated in an *MBMSInterestIndication* message. | |  |
| ***fembmsDedicatedCell***  Indicates whether the UE in RRC\_CONNECTED supports MBMS reception with 15 kHz subcarrier spacings via MBSFN from MBMS-dedicated cells on a frequency indicated in an *MBMSInterestIndication* message. | |  |
| ***flexibleUM-AM-Combinations***  Indicates whether the UE supports any combination of RLC UM and RLC AM bearers as long as the total number of bearers is at most 8, regardless of what FGI20 indicates. | | - |
| ***flightPathPlan***  Indicates whether UE supports reporting of flight path plan information. | | - |
| ***fourLayerTM3-TM4***  Indicates whether the UE supports 4-layer spatial multiplexing for TM3 and TM4. | | - |
| ***fourLayerTM3-TM4 (in FeatureSetDL-PerCC)***  Indicates whether the UE supports 4-layer spatial multiplexing for TM3 and TM4 for MR-DC within the indicated feature set. If this field is absent, UE supports two layer MIMO for TM3/TM4. | | - |
| ***fourLayerTM3-TM4-perCC***  Indicates whether the UE supports 4-layer spatial multiplexing for TM3 and TM4 for the component carrier. | | - |
| ***frameStructureType-SPT***  This field indicates the supported FS-type(s) for short processing time. The UE capability is reported per band combination. The reported FS-type(s) apply to the reported *maxNumberCCs-SPT-r15* for the given band combination. | | - |
| ***freqBandPriorityAdjustment***  Indicates whether the UE supports the prioritization of frequency bands in *multiBandInfoList* over the band in *freqBandIndicator* as defined by *freqBandIndicatorPriority-r12*. | | - |
| ***freqBandRetrieval***  Indicates whether the UE supports reception of *requestedFrequencyBands.* | | - |
| ***halfDuplex***  If *halfDuplex* is set to true, only half duplex operation is supported for the band, otherwise full duplex operation is supported. | | - |
| ***heightMeas***  Indicates whether UE supports the measurement events H1/H2. | | - |
| ***ho-EUTRA-5GC-FDD-TDD***  Indicates whether the UE supports handover between E-UTRA/5GC FDD and E-UTRA/5GC TDD. | | No |
| ***ho-InterfreqEUTRA-5GC***  Indicates whether the UE supports inter frequency handover within E-UTRA/5GC. | | Yes |
| ***hybridCSI***  Indicates whether the UE supports hybrid CSI transmission as described in TS 36.213 [23]. | | Yes |
| ***idleInactiveValidityAreaList***  Indicates whether the UE supports list of validity areas for measurements during RRC\_IDLE and RRC\_INACTIVE. | | No |
| ***immMeasBT***  Indicates whether the UE supports Bluetooth measurements in RRC connected mode. | | - |
| ***immMeasUnComBarPre***  Indicates whether the UE supports uncompensated barometric pressure measurements in RRC connected mode. | | - |
| ***immMeasWLAN***  Indicates whether the UE supports WLAN measurements in RRC connected mode. | | - |
| ***ims-VoiceOverMCG-BearerEUTRA-5GC***  Indicates whether the UE supports IMS voice over NR PDCP for MCG bearer for E-UTRA/5GC. | | No |
| ***ims-VoiceOverNR-FR1***  Indicates whether the UE supports IMS voice over NR FR1. | | No |
| ***ims-VoiceOverNR-FR2***  Indicates whether the UE supports IMS voice over NR FR2-1 as specified in TS 38.101-x [xx]. | | No |
| ***ims-VoiceOverNR-FR2-2***  Indicates whether the UE supports IMS voice over NR FR2-2 as specified in TS 38.101-x [xx]. | | - |
| ***ims-VoiceOverNR-PDCP-MCG-Bearer***  Indicates whether the UE supports IMS voice over NR PDCP with only MCG RLC bearer. | | Yes |
| ***ims-VoiceOverNR-PDCP-SCG-Bearer***  Indicates whether the UE supports IMS voice over NR PDCP with only SCG RLC bearer when configured with EN-DC. | | Yes |
| ***ims-VoNR-PDCP-SCG-NGENDC***  Indicates whether the UE supports IMS voice over NR PDCP with only SCG RLC bearer when configured with NGEN-DC. | | Yes |
| ***inactiveState***  Indicates whether the UE supports RRC\_INACTIVE. | | No |
| ***incMonEUTRA***  Indicates whether the UE supports increased number of E-UTRA carrier monitoring in RRC\_IDLE and RRC\_CONNECTED, as specified in TS 36.133 [16]. | | No |
| ***incMonUTRA***  Indicates whether the UE supports increased number of UTRA carrier monitoring in RRC\_IDLE and RRC\_CONNECTED, as specified in TS 36.133 [16]. | | No |
| ***inDeviceCoexInd***  Indicates whether the UE supports in-device coexistence indication as well as autonomous denial functionality. | | Yes |
| ***inDeviceCoexInd-ENDC***  Indicates whether the UE supports in-device coexistence indication for (NG)EN-DC operation. This field can be included only if *inDeviceCoexInd* is included. The UE supports *inDeviceCoexInd-ENDC* in the same duplexing modes as it supports *inDeviceCoexInd*. | | - |
| ***inDeviceCoexInd-HardwareSharingInd***  Indicates whether the UE supports indicating hardware sharing problems when sending the *InDeviceCoexIndication*, as well as omitting the TDM assistance information. A UE that supports hardware sharing indication shall also indicate support of LAA operation. | | - |
| ***inDeviceCoexInd-UL-CA***  Indicates whether the UE supports UL CA related in-device coexistence indication. This field can be included only if *inDeviceCoexInd* is included. The UE supports *inDeviceCoexInd-UL-CA* in the same duplexing modes as it supports *inDeviceCoexInd*. | | - |
| ***interBandTDD-CA-WithDifferentConfig***  Indicates whether the UE supports inter-band TDD carrier aggregation with different UL/DL configuration combinations. The first bit indicates UE supports the configuration combination of SCell DL subframes are a subset of PCell and PSCell by SIB1 configuration and the configuration combination of SCell DL subframes are a superset of PCell and PSCell by SIB1 configuration; the second bit indicates UE supports the configuration combination of SCell DL subframes are neither superset nor subset of PCell and PSCell by SIB1 configuration. This field is included only if UE supports inter-band TDD carrier aggregation. | | - |
| ***interBandPowerSharingAsyncDAPS***  Indicates whether the UE supports power sharing for asynchronous inter-band DAPS handovers. | | - |
| ***interBandPowerSharingSyncDAPS***  Indicates whether the UE supports power sharing for synchronous inter-band DAPS handovers. | | - |
| ***interferenceMeasRestriction***  Indicates whether the UE supports interference measurement restriction. | | Yes |
| ***interFreqAsyncDAPS***  Indicates whether the UE supports asynchronous DAPS handover in source PCell and inter-frequency target PCell. | | - |
| ***interFreqBandList***  One entry corresponding to each supported E‑UTRA band listed in the same order as in *supportedBandListEUTRA*. | | - |
| ***interFreqDAPS***  Indicates whether the UE supports DAPS handover in source PCell and inter-frequency target PCell, i.e. support of simultaneous DL reception of PDCCH and PDSCH from source and target cell. For a BC, the capability applies to every carrier pair for source and target. A UE indicating this capability shall also support synchronous DAPS handover, and single UL transmission for inter-frequency DAPS handover. | | - |
| ***interFreqMultiUL-TransmissionDAPS***  Indicates that the UE supports simultaneous UL transmission in source PCell and inter-frequency target PCell. | | - |
| ***interFreqNeedForGaps***  Indicates need for measurement gaps when operating on the E‑UTRA band given by the entry in *bandListEUTRA* or on the E-UTRA band combination given by the entry in *bandCombinationListEUTRA* and measuring on the E‑UTRA band given by the entry in *interFreqBandList*. | | - |
| ***interFreqProximityIndication***  Indicates whether the UE supports proximity indication for inter-frequency E-UTRAN CSG member cells*.* | | - |
| ***interFreqRSTD-Measurement***  Indicates whether the UE supports inter-frequency RSTD measurements for OTDOA positioning, as specified in TS 36.355 [54]. | | Yes |
| ***interFreqSI-AcquisitionForHO***  Indicates whether the UE supports, upon configuration of si-RequestForHO by the network, acquisition and reporting of relevant information using autonomous gaps by reading the SI from a neighbouring inter-frequency cell. | | Yes |
| ***interRAT-BandList***  One entry corresponding to each supported band of another RAT listed in the same order as in the *interRAT-Parameters*. The NR bands reported in *SupportedBandListNR* are excluded from this list. | | - |
| ***interRAT-BandListNR-EN-DC***  One entry corresponding to each supported NR band listed in the same order as in the *supportedBandListEN-DC-r15*. If both *interRAT-BandListNR-EN-DC* and *interRAT-BandListNR-SA* are included, the UE shall set the same *interRAT-NeedForGapsNR* value for the same NR band. | | - |
| ***interRAT-BandListNR-SA***  One entry corresponding to each supported NR band listed in the same order as in the *supportedBandListNR-SA*. If both *interRAT-BandListNR-EN-DC* and *interRAT-BandListNR-SA* are included, the UE shall set the same *interRAT-NeedForGapsNR* value for the same NR band. | | - |
| ***interRAT-enhancementNR***  Indicates whether the UE supports enhanced inter-RAT NR measurement requirements to support high speed up to 500 km/h as specified in TS 36.133 [16], when EN-DC is not configured and when EN-DC is configured. | | - |
| ***interRAT-NeedForGaps***  Indicates need for DL measurement gaps when operating on the E‑UTRA band given by the entry in *bandListEUTRA or on the E-UTRA band combination given by the entry in bandCombinationListEUTRA* and measuring on the inter-RAT band given by the entry in the *interRAT-BandList*. | | - |
| ***interRAT-NeedForGapsNR***  Indicates need for measurement gaps when operating on the E‑UTRA band given by the entry in *supportedBandListEUTRA or on the E-UTRA band combination given by the entry in supportedBandCombination-r10 or supportedBandCombinationAdd-r11* or *supportedBandCombinationReduced-r13* and measuring on the NR band given by the entry in the *InterRAT-BandListNR*. | | - |
| ***interRAT-ParametersWLAN***  Indicates whether the UE supports WLAN measurements configured by *MeasObjectWLAN* with corresponding quantity and report configuration in the supported WLAN bands. | | - |
| ***interRAT-PS-HO-ToGERAN***  Indicates whether the UE supports inter-RAT PS handover to GERAN or not. | | Yes |
| ***intraBandContiguousCC-InfoList***  Indicates, per serving carrier of which the corresponding bandwidth class includes multiple serving carriers (i.e. bandwidth class B, C, D and so on), the maximum number of supported layers for spatial multiplexing in DL and the maximum number of CSI processes supported. The number of entries is equal to the number of component carriers in the corresponding bandwidth class. The UE shall support the setting indicated in each entry of the list regardless of the order of entries in the list.The UE shall include the field only if it supports 4-layer spatial multiplexing in transmission mode3/4 for a subset of component carriers in the corresponding bandwidth class, or if the maximum number of supported layers for at least one component carrier is higher than *supportedMIMO-CapabilityDL-r10* in the corresponding bandwidth class, or if the number of CSI processes for at least one component carrier is higher than *supportedCSI-Proc-r11* in the corresponding band.  This field may also be included for bandwidth class A but in such a case without including any sub-fields in *IntraBandContiguousCC-Info-r12* (see NOTE 6). | | - |
| ***intraFreqA3-CE-ModeA***  Indicates whether the UE when operating in CE Mode A supports *eventA3* for intra-frequency neighbouring cells. | | - |
| ***intraFreqA3-CE-ModeB***  Indicates whether the UE when operating in CE Mode B supports *eventA3* for intra-frequency neighbouring cells. | | - |
| ***intraFreq-CE-NeedForGaps***  Indicates need for measurement gaps when operating in CE on the E‑UTRA band given by the entry in *supportedBandListEUTRA.* | |  |
| ***intraFreqAsyncDAPS***  Indicates whether the UE supports asynchronous DAPS handover in source PCell and intra-frequency target PCell. | | - |
| ***intraFreqDAPS***  Indicates whether UE supports DAPS handover in source PCell and intra-frequency target PCell, i.e. support of simultaneous DL reception of PDCCH and PDSCH from source and target cell. A UE indicating this capability shall also support synchronous DAPS handover, and single UL transmission for intra-frequency DAPS handover. | | - |
| ***intraFreqHO-CE-ModeA***  Indicates whether the UE when operating in CE Mode A supports intra-frequency handover. | | - |
| ***intraFreqHO-CE-ModeB***  Indicates whether the UE when operating in CE Mode B supports intra-frequency handover. | | - |
| ***intraFreqProximityIndication***  Indicates whether the UE supports proximity indication for intra-frequency E-UTRAN CSG member cells. | | - |
| ***intraFreqSI-AcquisitionForHO***  Indicates whether the UE supports, upon configuration of si-RequestForHO by the network, acquisition and reporting of relevant information using autonomous gaps by reading the SI from a neighbouring intra-frequency cell. | | Yes |
| ***intraFreqTwoTAGs-DAPS***  Indicates whether the UE supports different timing advance groups in source PCell and intra-frequency target PCell. It is mandatory for *intraFreqDAPS* capable UE. | | - |
| ***jointEHC-ROHC-Config***  Indicates whether the UE supports simultaneous configuration of EHC and ROHC protocols for the same DRB. | | No |
| ***k-Max (in MIMO-CA-ParametersPerBoBCPerTM)***  If signalled, the field indicates for a particular transmission mode the maximum number of NZP CSI RS resource configurations supported within a CSI process applicable for the concerned band combination. | | No |
| ***k-Max (in MIMO-UE-ParametersPerTM)***  Indicates for a particular transmission mode the maximum number of NZP CSI RS resource configurations supported within a CSI process applicable for band combinations for which the concerned capabilities are not signalled. | | Yes |
| ***laa-PUSCH-Mode1***  Indicates whether the UE supports LAA PUSCH mode 1as defined in TS 36.213 [23]. | | - |
| ***laa-PUSCH-Mode2***  Indicates whether the UE supports LAA PUSCH mode 2as defined in TS 36.213 [23]*.* | | - |
| ***laa-PUSCH-Mode3***  Indicates whether the UE supports LAA PUSCH mode 3as defined in TS 36.213 [23]*.* | | - |
| ***locationReport***  Indicates whether the UE supports reporting of its geographical location information to eNB. | | - |
| ***loggedMBSFNMeasurements***  Indicates whether the UE supports logged measurements for MBSFN. A UE indicating support for logged measurements for MBSFN shall also indicate support for logged measurements in Idle mode. | | - |
| ***loggedMeasBT***  Indicates whether the UE supports Bluetooth measurements in RRC idle mode. | | - |
| ***loggedMeasIdleEventL1***  Indicates whether the UE supports event triggered logged measurements for *eventL1* in Idle mode. | | - |
| ***loggedMeasIdleEventOutOfCoverage***  Indicates whether the UE supports event triggered logged measurements for *outOfCoverage* in Idle mode. | | - |
| ***loggedMeasUnComBarPre***  Indicates whether the UE supports uncompensated barometric pressure measurements in RRC\_IDLE mode. | | - |
| ***loggedMeasurementsIdle***  Indicates whether the UE supports logged measurements in Idle mode. | | - |
| ***loggedMeasWLAN***  Indicates whether the UE supports WLAN measurements in RRC idle mode. | | - |
| ***logicalChannelSR-ProhibitTimer***  Indicates whether the UE supports the *logicalChannelSR-ProhibitTimer* as defined in TS 36.321 [6]. | | - |
| ***longDRX-Command***  Indicates whether the UE supports Long DRX Command MAC Control Element. | | - |
| ***lwa***  Indicates whether the UE supports LTE-WLAN Aggregation (LWA). The UE which supports LWA shall also indicate support of *interRAT-ParametersWLAN-r13*. | | - |
| ***lwa-BufferSize***  Indicates whether the UE supports the layer 2 buffer sizes for "with support for split bearers" as defined in Table 4.1-3 and 4.1A-3 of TS 36.306 [5] for LWA. | | - |
| ***lwa-HO-WithoutWT-Change***  Indicates whether the UE supports handover where LWA configuration is retained without WT change and using LWA end-marker for PDCP key change indication for LWA operation. | | - |
| ***lwa-RLC-UM***  Indicates whether the UE supports RLC UM for LWA bearer. | | - |
| ***lwa-SplitBearer***  Indicates whether the UE supports the split LWA bearer (as defined in TS 36.300 [9]). | | - |
| ***lwa-UL***  Indicates whether the UE supports UL transmission over WLAN for LWA bearer. | | - |
| ***lwip***  Indicates whether the UE supports LTE/WLAN Radio Level Integration with IPsec Tunnel (LWIP). The UE which supports LWIP shall also indicate support of *interRAT-ParametersWLAN-r13*. | | - |
| ***lwip-Aggregation-DL, lwip-Aggregation-UL***  Indicates whether the UE supports aggregation of LTE and WLAN over DL/UL LWIP. The UE that indicates support of LWIP aggregation over DL or UL shall also indicate support of *lwip*. | | - |
| ***makeBeforeBreak***  Indicates whether the UE supports intra-frequency Make-Before-Break handover, and whether the UE which indicates *dc-Parameters* supports intra-frequency Make-Before-Break SeNB change, as defined in TS 36.300 [9]. | | - |
| ***measGapPatterns-NRonly***  Indicates whether the UE supports gap patterns 2, 3 and 11 in LTE standalone when the frequencies to be measured within this measurement gap are all NR frequencies. | | No |
| ***measGapPatterns-NRonly-ENDC***  Indicates whether the UE supports gap patterns 2, 3 and 11 in (NG)EN-DC when the frequencies to be measured within this measurement gap are all NR frequencies. | | No |
| ***maximumCCsRetrieval***  Indicates whether UE supports reception of *requestedMaxCCsDL* and *requestedMaxCCsUL*. | | - |
| ***maxLayersMIMO-Indication***  Indicates whether the UE supports the network configuration of *maxLayersMIMO*. If the UE supports *fourLayerTM3-TM4* or *intraBandContiguousCC-InfoList* or *FeatureSetDL-PerCC* for MR-DC, UE supports the configuration of *maxLayersMIMO* for these cases regardless of indicating *maxLayersMIMO-Indication*. | | - |
| ***maxLayersSlotOrSubslotPUSCH***  Indicates the maxiumum number of layers for slot-PUSCH or subslot-PUSCH transmission. | | Yes |
| ***maxNumberCCs-SPT***  Indicates the maximum number of supported CCs for short processing time. The UE capability is reported per band combination. The reported number of carriers applies to all the FS-type(s) *frameStructureType-SPT-r15* supported in a given band combination. Absence of the field indicates that 0 number of CCs are supported for short processing time. | | - |
| ***maxNumberDL-CCs, maxNumberUL-CCs***  Indicates for each TTI combination "sTTI-SupportedCombinations", the maximum number of supported DL CCs/UL CCs for short TTI. Absence of the field indicates that 0 number of CCs are supported for short TTI. | | - |
| ***maxNumberDecoding***  Indicates the maximum number of blind decodes in UE-specific search space per UE in one subframe for CA with more than 5 CCs as defined in TS 36.213 [23] which is supported by the UE. The number of blind decodes supported by the UE is the field value \* 32. Only values 5 to 32 can be used in this version of the specification. | | No |
| ***maxNumberEHC-Contexts***  Defines the maximum number of Ethernet header compression contexts supported by the UE across all DRBs and across UE's EHC compressor and EHC decompressor. The indicated number defines the number of contexts in addition to CID = "all zeros" as specified in Annex A of TS 38.323 [83]. | | No |
| ***maxNumberROHC-ContextSessions***  Set to the maximum number of concurrently active ROHC contexts supported by the UE, excluding context sessions that leave all headers uncompressed. cs2 corresponds with 2 (context sessions), cs4 corresponds with 4 and so on. The network ignores this field if the UE supports none of the ROHC profiles in *supportedROHC-Profiles*. If the UE indicates both *maxNumberROHC-ContextSessions* and *maxNumberROHC-ContextSessions-r14*, same value shall be indicated. | | - |
| ***maxNumberUpdatedCSI-Proc, maxNumberUpdatedCSI-Proc-SPT***  Indicates the maximum number of CSI processes to be updated across CCs. | | No |
| ***maxNumberUpdatedCSI-Proc-STTI-Comb77, maxNumberUpdatedCSI-Proc-STTI-Comb27, maxNumberUpdatedCSI-Proc-STTI-Comb22-Set1, maxNumberUpdatedCSI-Proc-STTI-Comb22-Set2***  Indicates the maximum number of CSI processes to be updated across CCs. Comb77 is applicable for {slot, slot}, Comb27 for {subslot, slot}, Comb22-Set1 for  {subslot, subslot} processing timeline set 1 and the Comb22-Set2 for {subslot, subslot} processing timeline set 2. | |  |
| ***mbms-AsyncDC***  Indicates whether the UE in RRC\_CONNECTED supports MBMS reception via MRB on a frequency indicated in an *MBMSInterestIndication* message, where (according to *supportedBandCombination*) the carriers that are or can be configured as serving cells in the MCG and the SCG are not synchronized. If this field is included, the UE shall also include *mbms-SCell* and *mbms-NonServingCell*. The field indicates that the UE supports the feature for xDD if *mbms-SCell* and *mbms-NonServingCell* are supported for xDD. | | - |
| ***mbms-MaxBW***  Indicates maximum supported bandwidth (T) for MBMS reception, see TS 36.213 [23]. clause 11.1. If the value is set to *implicitValue*, the corresponding value of T is calculated as specified in TS 36.213 [23], clause 11.1. If the value is set to *explicitValue*, the actual value of T = *explicitValue* \* 40 MHz. | | - |
| ***mbms-NonServingCell***  Indicates whether the UE in RRC\_CONNECTED supports MBMS reception via MRB on a frequency indicated in an *MBMSInterestIndication* message, where (according to *supportedBandCombination* and to network synchronization properties) a serving cell may be additionally configured. If this field is included, the UE shall also include the *mbms-SCell* field. | | Yes |
| ***mbms-ScalingFactor1dot25, mbms-ScalingFactor7dot5***  Indicates parameter A(1.25 / A(7.5, i.e., scaling factor for processing one unit of bandwidth corresponding to subcarrier spacing of 1.25 kHz / 7.5 kHz, with respect to one unit of bandwidth corresponding to subcarrier spacing of 15 kHz. See TS 36.213 [23], clause 11.1. This field is included only if *subcarrierSpacingMBMS-khz1dot25 / subcarrierSpacingMBMS-khz7dot5* is included. This field shall be included if *mbms-MaxBW* and *subcarrierSpacingMBMS-khz1dot25 / subcarrierSpacingMBMS-khz7dot5* are included. | | - |
| ***mbms-ScalingFactor0dot37, mbms-ScalingFactor2dot5***  Indicates parameter A(0.37 / A(2..5, i.e., scaling factor for processing one unit of bandwidth corresponding to subcarrier spacing of 0.37 kHz / 2.5 kHz, with respect to one unit of bandwidth corresponding to subcarrier spacing of 15 kHz. See TS 36.213 [23], clause 11.1. This field is included only if *fembmsMixedCell* or *fembmsDedicatedCell* is included. This field shall be included if *subcarrierSpacingMBMS-khz0dot37 / subcarrierSpacingMBMS-khz2dot5* is included for at least one E-UTRA band in *mbms-SupportedBandInfoList*. | | - |
| ***mbms-SCell***  Indicates whether the UE in RRC\_CONNECTED supports MBMS reception via MRB on a frequency indicated in an *MBMSInterestIndication* message, when an SCell is configured on that frequency (regardless of whether the SCell is activated or deactivated). | | Yes |
| ***mbms-SupportedBandInfoList***  One entry corresponding to each supported E-UTRA band listed in the same order as in *supportedBandListEUTRA*. This list is included only if *fembmsMixedCell* or *fembmsDedicatedCell* is included. If *mbms-SupportedBandInfoList-v1700* is included, the UE shall include the same number of entries, and listed in the same order, as in *mbms-SupportedBandInfoList-r16*. | | - |
| ***mcgRLF-RecoveryViaSCG***  Indicates whether the UE supports recovery from MCG RLF via split SRB1 (if supported) and via SRB3 (if supported). | | - |
| ***measGapPatterns-NRonly***  Indicates whether the UE supports gap patterns 2, 3 and 11 in LTE standalone when the frequencies to be measured within this measurement gap are all NR frequencies. | | No |
| ***measGapPatterns-NRonly-ENDC***  Indicates whether the UE supports gap patterns 2, 3 and 11 in (NG)EN-DC when the frequencies to be measured within this measurement gap are all NR frequencies. | | No |
| ***measurementEnhancements***  This field defines whether UE supports measurement enhancements in high speed scenario (350 km/h) as specified in TS 36.133 [16]. | | - |
| ***measurementEnhancements2***  This field defines whether UE supports measurement enhancements in high speed scenario (up to 500 km/h velocity) as specified in TS 36.133 [16]. | | - |
| ***measurementEnhancementsSCell***  This field defines whether UE supports SCell measurement enhancements in high speed scenario (350 km/h) as specified in TS 36.133 [16]. | | - |
| ***measGapPatterns***  Indicates whether the UE that supports NR supports gap patterns 4 to 11 in LTE standalone as specified in TS 36.133 [16], and for independent measurement gap configuration on FR1 and per-UE gap in (NG)EN-DC as specified in TS 38.133 [84]. The first/ leftmost bit covers pattern 4, and so on. Value 1 indicates that the UE supports the concerned gap pattern. | | - |
| ***mfbi-UTRA***  It indicates if the UE supports the signalling requirements of multiple radio frequency bands in a UTRA FDD cell, as defined in TS 25.307 [65]. | | - |
| ***MIMO-BeamformedCapabilityList***  A list of pairs of {k-Max, n-MaxList} values with the nth entry indicating the values that the UE supports for each CSI process in case n CSI processes would be configured. | | No |
| ***MIMO-CapabilityDL***  The number of supported layers for spatial multiplexing in DL. The field may be absent for category 0 and category 1 UE in which case the number of supported layers is 1. | | - |
| ***MIMO-CapabilityUL***  The number of supported layers for spatial multiplexing in UL. Absence of the field means that the number of supported layers is 1. | | - |
| ***MIMO-CA-ParametersPerBoBC***  A set of MIMO parameters provided per band of a band combination. In case a subfield is absent, the concerned capabilities are the same as indicated at the per UE level (i.e. by MIMO-UE-ParametersPerTM). | | - |
| ***mimo-CBSR-AdvancedCSI***  Indicates whether UE supports CBSR for advanced CSI reporting with and without amplitude restriction as defined in TS 36.213 [23], clause 7.2. | | Yes |
| ***min-Proc-TimelineSubslot***  Minimum processing timeline for subslot operation. The minimum processing timeline can belong to one of two sets of associated processing and maximum TA operation. The sets supported can be different for 1os CRS-based SPDCCH, 2os CRS-based SPDCCH and DMRS-based SPDCCH. The sequence applies to:  1. 1os CRS based SPDCCH  2. 2os CRS based SPDCCH  3. DMRS based SPDCCH | | - |
| ***modifiedMPR-Behavior***  Field encoded as a bit map, where at least one bit N is set to "1" if UE supports modified MPR/A-MPR behaviour N, see TS 36.101 [42]. All remaining bits of the field are set to "0". The leading / leftmost bit (bit 0) corresponds to modified MPR/A-MPR behaviour 0, the next bit corresponds to modified MPR/A-MPR behaviour 1 and so on.  Absence of this field means that UE does not support any modified MPR/A-MPR behaviour. | | - |
| ***mpdcch-InLteControlRegionCE-ModeA,*** ***mpdcch-InLteControlRegionCE-ModeB***  Indicates whether UE operating in CE mode A/B supports MPDCCH reception in LTE control channel region as specified in TS 36.211 [21]. | | Yes |
| ***mpsPriorityIndication***  Indicates whether the UE supports *mpsPriorityIndication* on release with redirect. | | - |
| ***multiACK-CSI-reporting***  Indicates whether the UE supports multi-cell HARQ ACK and periodic CSI reporting and SR on PUCCH format 3. | | Yes |
| ***multiBandInfoReport***  Indicates whether the UE supports the acquisition and reporting of multi band information for *reportCGI*. | | - |
| ***multiClusterPUSCH-WithinCC*** | | Yes |
| ***multiNS-Pmax***  Indicates whether the UE supports the mechanisms defined for cells broadcasting *NS-PmaxList*. | | - |
| ***multipleCellsMeasExtension***  Indicates whether the UE supports numberOfTriggeringCells in the report configuration. | | - |
| ***multipleTimingAdvance***  Indicates whether the UE supports multiple timing advances for each band combination listed in *supportedBandCombination*. If the band combination comprised of more than one band entry (i.e., inter-band or intra-band non-contiguous band combination), the field indicates that the same or different timing advances on different band entries are supported. If the band combination comprised of one band entry (i.e., intra-band contiguous band combination), the field indicates that the same or different timing advances across component carriers of the band entry are supported. It is mandatory for UEs to support 2 TAGs for inter frequency DAPS handover. | | - |
| ***multipleUplinkSPS***  Indicates whether the UE supports multiple uplink SPS and reporting SPS assistance information. A UE indicating *multipleUplinkSPS* shall also support V2X communication via Uu, as defined in TS 36.300 [9]. | | - |
| ***must-CapabilityPerBand***  Indicates that UE supports MUST, as specified in 36.212 [22], clause 5.3.3.1, on the band in the band combination. | | - |
| ***must-TM234-UpTo2Tx-r14***  Indicates that the UE supports MUST operation for TM2/3/4 using up to 2Tx. | | - |
| ***must-TM89-UpToOneInterferingLayer-r14***  Indicates that the UE supports MUST operation for TM8/9 with assistance information for up to 1 interfering layer. | | - |
| ***must-TM89-UpToThreeInterferingLayers-r14***  Indicates that the UE supports MUST operation for TM8/9 with assistance information for up to 3 interfering layers. | | - |
| ***must-TM10-UpToOneInterferingLayer-r14***  Indicates that the UE supports MUST operation for TM10 with assistance information for up to 1 interfering layer. | | - |
| ***must-TM10-UpToThreeInterferingLayers-r14***  Indicates that the UE supports MUST operation for TM10 with assistance information for up to 3 interfering layers. | | - |
| ***naics-Capability-List***  Indicates that UE supports NAICS, i.e. receiving assistance information from serving cell and using it to cancel or suppress interference of neighbouring cell(s) for at least one band combination. If not present, UE does not support NAICS for any band combination. The field *numberOfNAICS-CapableCC* indicates the number of component carriers where the NAICS processing is supported and the field *numberOfAggregatedPRB* indicates the maximum aggregated bandwidth across these of component carriers (expressed as a number of PRBs) with the restriction that NAICS is only supported over the full carrier bandwidth. The UE shall indicate the combination of {*numberOfNAICS-CapableCC, numberOfNAICS-CapableCC*} for every supported *numberOfNAICS-CapableCC*, e.g. if a UE supports {x CC, y PRBs} and {x-n CC, y-m PRBs} where n>=1 and m>=0, the UE shall indicate both.  - For *numberOfNAICS-CapableCC* = 1, UE signals one value for *numberOfAggregatedPRB* from the range {50, 75, 100};  - For *numberOfNAICS-CapableCC* = 2, UE signals one value for *numberOfAggregatedPRB* from the range {50, 75, 100, 125, 150, 175, 200};  - For *numberOfNAICS-CapableCC* = 3, UE signals one value for *numberOfAggregatedPRB* from the range {50, 75, 100, 125, 150, 175, 200, 225, 250, 275, 300};  - For *numberOfNAICS-CapableCC* = 4, UE signals one value for *numberOfAggregatedPRB* from the range {50, 100, 150, 200, 250, 300, 350, 400};  - For *numberOfNAICS-CapableCC* = 5, UE signals one value for *numberOfAggregatedPRB* from the range {50, 100, 150, 200, 250, 300, 350, 400, 450, 500}. | | No |
| ***ncsg***  Indicates whether the UE supports measurement NCSG Pattern Id 0, 1, 2 and 3, as specified in TS 36.133 [16]. If this field is included and the UE supports asynchronous DC, the UE shall support NCSG Pattern Id 0, 1, 2 and 3. If this field is included but the UE does not support asynchronous DC, only NCSG Pattern Id 0 and 1 shall be supported | | No |
| ***ng-EN-DC***  Indicates whether the UE supports NGEN-DC. | | - |
| ***n-MaxList (in MIMO-UE-ParametersPerTM)***  Indicates for a particular transmission mode the maximum number of NZP CSI RS ports supported within a CSI process applicable for band combinations for which the concerned capabilities are not signalled. For *k-Max* values exceeding 1, the UE shall include the field and signal *k-Max* minus 1 bits. The first bit indicates *n-Max2*, with value 0 indicating 8 and value 1 indicating 16. The second bit indicates *n-Max3*, with value 0 indicating 8 and value 1 indicating 16. The third bit indicates *n-Max4*, with value 0 indicating 8 and value 1 indicating 32. The fourth bit indicates *n-Max5*, with value 0 indicating 16 and value 1 indicating 32. The fifth bit indicates *n-Max6*, with value 0 indicating 16 and value 1 indicating 32. The sixt bit indicates *n-Max7*, with value 0 indicating 16 and value 1 indicating 32. The seventh bit indicates *n-Max8*, with value 0 indicating 16 and value 1 indicating 64. | | Yes |
| ***n-MaxList (in MIMO-CA-ParametersPerBoBCPerTM)***  If signalled, the field indicates for a particular transmission mode the maximum number of NZP CSI RS ports supported within a CSI process applicable for band the concerned combination. Further details are as indicated for *n-MaxList* in *MIMO-UE-ParametersPerTM*. | | No |
| ***NonContiguousUL-RA-WithinCC-List***  One entry corresponding to each supported E-UTRA band listed in the same order as in *supportedBandListEUTRA*. | | No |
| ***nonPrecoded (in MIMO-UE-ParametersPerTM)***  Indicates for a particular transmission mode the UE capabilities concerning non-precoded EBF/ FD-MIMO operation (class A) for band combinations for which the concerned capabilities are not signalled in *MIMO-CA-ParametersPerBoBCPerTM*, and the FD-MIMO processing capability condition as described in NOTE 8 is satisfied. | | Yes |
| ***nonPrecoded (in MIMO-CA-ParametersPerBoBCPerTM)***  If signalled, the field indicates for a particular transmission mode, the UE capabilities concerning non-precoded EBF/ FD-MIMO operation (class A) applicable for the concerned band combination. | | - |
| ***nonUniformGap***  Indicates whether the UE supports measurement non uniform Pattern Id 1, 2, 3 and 4 in LTE standalone as specified in TS 36.133 [16]. | | No |
| ***noResourceRestrictionForTTIBundling***  Indicate whether the UE supports TTI bundling operation without resource allocation restriction. | | No |
| ***nonCSG-SI-Reporting***  Indicates whether UE will report PLMN list from non-CSG cells. | | - |
| ***nr-AutonomousGaps-ENDC-FR1***  Indicates whether the UE supports, upon configuration of *useAutonomousGapsNR* by the network, acquisition of relevant information from a neighbouring NR cell by reading the SI of the neighbouring cell on FR1 using autonomous gaps and reporting the acquired information to the network when it is configured with (NG)EN-DC. | | Yes |
| ***nr-AutonomousGaps-ENDC-FR2***  Indicates whether the UE supports, upon configuration of *useAutonomousGapsNR* by the network, acquisition of relevant information from a neighbouring NR cell by reading the SI of the neighbouring cell on FR2 using autonomous gaps and reporting the acquired information to the network when it is configured with (NG)EN-DC. | | Yes |
| ***nr-AutonomousGaps-FR1***  Indicates whether the UE supports, upon configuration of *useAutonomousGapsNR* by the network, acquisition of relevant information from a neighbouring NR cell by reading the SI of the neighbouring cell on FR1 using autonomous gaps and reporting the acquired information to the network when it is not configured with (NG)EN-DC. | | Yes |
| ***nr-AutonomousGaps-FR2***  Indicates whether the UE supports, upon configuration of *useAutonomousGapsNR* by the network, acquisition of relevant information from a neighbouring NR cell by reading the SI of the neighbouring cell on FR2 using autonomous gaps and reporting the acquired information to the network when it is not configured with (NG)EN-DC. | | Yes |
| ***nr-HO-ToEN-DC***  Indicates whether the UE supports inter-RAT handover from NR to EN-DC while NR-DC or NE-DC is not configured. This field is mandatory present if EN-DC is supported. | | - |
| ***nr-IdleInactiveBeamMeasFR1***  Indicates whether the UE supports performing eNB-configured SSB-based beam level RRM measurements for configured NR FR1 carrier(s) in RRC\_IDLE and in RRC\_INACTIVE as specified in TS 36.306 [5], clause 4.3.6.46. | | No |
| ***nr-IdleInactiveBeamMeasFR2***  Indicates whether the UE supports performing eNB-configured SSB-based beam level RRM measurements for configured NR FR2 carrier(s) in RRC\_IDLE and in RRC\_INACTIVE as specified in TS 36.306 [5], clause 4.3.6.47. | | No |
| ***nr-IdleInactiveMeasFR1***  Indicates whether UE supports reporting measurements performed on NR FR1 carrier(s) during RRC\_IDLE and RRC\_INACTIVE. | | No |
| ***nr-IdleInactiveMeasFR2***  Indicates whether UE supports reporting measurements performed on NR FR2 carrier(s) during RRC\_IDLE and RRC\_INACTIVE. | | No |
| ***nr-RSSI-ChannelOccupancyReporting***  Indicates whether the UE supports performing measurements and reporting of RSSI and channel occupancy on the corresponding NR band. | | - |
| ***ntn-Connectivity-EPC***  Indicates whether the UE supports NTN access when connected to EPC. If the UE indicates this capability, the UE shall support all NTN essential features as specified in TS 36.306 [5]. | | - |
| ***ntn-OffsetTimingEnh***  Indicates whether the UE supports timing relationship enhancement using Koffset as specified in TS36.321 [6] and TS 36.213 [23]. | | - |
| ***ntn-PUR-TimerDelay***  Indicates whether the UE supports delaying the start of the *pur-ResponseWindowTimer* for NTN, see TS 36.321 [6]. | | - |
| ***ntn-ScenarioSupport***  Indicates whether the UE supports NTN features only for GSO or NSGO scenario. | | - |
| ***ntn-TA-report***  Indicates whether the UE supports time advance reporting in RRC\_CONNECTED, see TS 36.321 [6]. | | - |
| ***numberOfBlindDecodesUSS***  Indicates the maximum number of blind decodes in UE specific search space in one subframe for CCs configured with sTTI operation supported by the UE. The number of blind decodes supported by the UE is the field value X\*68. Field value ranges from 4 to 32. | | Yes |
| ***nzp-CSI-RS-AperiodicInfo***  Indicates whether the UE supports aperiodic NZP CSI-RS transmission for the indicated transmission mode. | | Yes |
| ***nzp-CSI-RS-PeriodicInfo***  Indicates whether the UE supports periodic NZP CSI-RS transmission for the indicated transmission mode. | | Yes |
| ***otdoa-UE-Assisted***  Indicates whether the UE supports UE-assisted OTDOA positioning, as specified in TS 36.355 [54]. | | Yes |
| ***outOfOrderDelivery***  Same as "*outOfOrderDelivery*" defined in TS 38.306 [87]. | | No |
| ***outOfSequenceGrantHandling***  Indicates whether the UE supports PUSCH transmissions with out of sequence UL grants as defined in TS 36.213 [23]. This field can be included only if uplinkLAA is included. | | - |
| ***overheatingInd***  Indicates whether the UE supports overheating assistance information. | | No |
| ***overheatingIndForSCG***  Indicates whether the UE supports the inclusion of NR SCG reduced configuration in the overheating assistance information. The UE which indicates support of *overheatingIndForSCG* shall also indicate support of *overheatingInd*. | | - |
| ***pdcch-CandidateReductions***  Indicates whether the UE supports PDCCH candidate reduction on UE specific search space as specified in TS 36.213 [23], clause 9.1.1. | | No |
| ***pdcp-Duplication***  Indicates whether the UE supports PDCP duplication. | | - |
| ***pdcp-SN-Extension***  Indicates whether the UE supports 15 bit length of PDCP sequence number. | | - |
| ***pdcp-SN-Extension-18bits***  Indicates whether the UE supports 18 bit length of PDCP sequence number. | | - |
| ***pdcp-TransferSplitUL***  Indicates whether the UE supports PDCP data transfer split in UL for the *drb-TypeSplit* as specified in TS 36.323 [8]. | | - |
| ***pdcp-VersionChangeWithoutHO***  Indicates whether, the UE supports changing the PDCP version of DRBs, from LTE PDCP to NR PDCP and vice versa, with and without handover. A UE supporting PDCP version change shall signal field *pdcp-Parameters-v1610*. When the field *pdcp-VersionChangeWithoutHO* is not included and *pdcp-Parameters-v1610* is included, it implies the UE supports PDCP version change only with handover. | | - |
| ***pdsch-CollisionHandling***  Indicates whether the UE supports PDSCH collision handling as specified in TS 36.213 [23]. | | No |
| ***pdsch-InLteControlRegionCE-ModeA, pdsch-InLteControlRegionCE-ModeB***  Indicates whether UE operating in CE mode A/B supports PDSCH reception in LTE control channel region as specified in TS 36.211 [21]. | | Yes |
| ***pdsch-MultiTB-CE-ModeA, pdsch-MultiTB-CE-ModeB***  Indicates whether the UE supports multiple TB scheduling in connected mode for PDSCH when operating in CE mode A/B, as specified in TS 36.211 [21] and TS 36.213 [23]. | | Yes |
| ***pdsch-RepSubframe***  Indicates whether the UE supports subframe PDSCH repetition. | | Yes |
| ***pdsch-RepSlot***  Indicates whether the UE supports slot PDSCH repetition. | | Yes |
| ***pdsch-RepSubslot***  Indicates whether the UE supports subslot PDSCH repetition. This field is only applicable for UEs supporting FDD. | | - |
| ***pdsch-SlotSubslotPDSCH-Decoding***  Indicates whether the UE supports decoding of PDSCH and slot-PDSCH/subslot-PDSCH assigned with C-RNTI/SPS C-RNTI in the same subframe for a given carrier. | | Yes |
| ***perServingCellMeasurementGap***  Indicates whether the UE supports per serving cell measurement gap indication, as specified in TS 36.133 [16]. | | - |
| ***phy-TDD-ReConfig-FDD-PCell***  Indicates whether the UE supports TDD UL/DL reconfiguration for TDD serving cell(s) via monitoring PDCCH with eIMTA-RNTI on a FDD PCell, and HARQ feedback according to UL and DL HARQ reference configurations. This bit can only be set to supported only if the UE supports FDD PCell and *phy-TDD-ReConfig-TDD-PCell* is set to supported. | | No |
| ***phy-TDD-ReConfig-TDD-PCell***  Indicates whether the UE supports TDD UL/DL reconfiguration for TDD serving cell(s) via monitoring PDCCH with eIMTA-RNTI on a TDD PCell, and HARQ feedback according to UL and DL HARQ reference configurations, and PUCCH format 3. | | Yes |
| ***pmch-Bandwidth-n40, pmch-Bandwidth-n35, pmch-Bandwidth-n30***  Indicates, for the E‑UTRA band corresponding to the entry in *mbms-SupportedBandInfoList-v1700*, whether the UE in RRC\_CONNECTED supports MBMS reception via MBSFN from MBMS-dedicated cells in an MBSFN area with PMCH bandwidth of 40/ 35/ 30 PRBs as described in TS 36.211 [21] and TS 36.213 [23]. | - | |
| ***pmi-Disabling*** | | Yes |
| ***powerClass-14dBm***  Indicates whether the UE supports power class 14 dBm when operating in CE mode A or B for all the bands that are supported by the UE, as specified in TS 36.101 [42]. | | - |
| ***powerPrefInd***  Indicates whether the UE supports power preference indication. | | No |
| ***powerUCI-SlotPUSCH, powerUCI-SubslotPUSCH***  Indicates whether the UE supports BPRE derivation based on the actual derived O\_CQI. The parameter *uplinkPower-CSIPayload* configures the UE to derive BPRE based on either the actual value of O\_CQI or the largest value of O\_CQI across all RI values. If the UE does not support the capability, the UE will derive BPRE based on the largest value of O\_CQI across all RI values. | | Yes |
| ***prach-Enhancements***  This field defines whether the UE supports random access preambles generated from restricted set type B in high speed scenoario as specified in TS 36.211 [21]. | | - |
| ***processingTimelineSet***  Indicates, for each SPDCCH configuration, support for a set of TA values. Each set consists of two different processing timelines and associated maximum TA. Set 1 indicates support for n+4 and n+6 and set 2 indicates support for n+6 and n+8, see TS 36.211 [21], clause 8.1, The minimum processing timeline to use, out of the two options for a given set is configured by parameter *proc-Timeline*. Support of Set 1 implicitly means support of Set 2. | | - |
| ***pucch-Format4***  Indicates whether the UE supports PUCCH format 4. | | Yes |
| ***pucch-Format5***  Indicates whether the UE supports PUCCH format 5. | | Yes |
| ***pucch-SCell***  Indicates whether the UE supports PUCCH on SCell. | | No |
| ***pur-CP-EPC-CE-ModeA, pur-CP-EPC-CE-ModeB, pur-CP-5GC-CE-ModeA, pur-CP-5GC-CE-ModeB***  Indicates whether UE operating in CE mode A/B supports CP transmission using PUR when connected to EPC/ 5GC. | | Yes |
| ***pur-CP-L1Ack***  Indicates whether UE supports L1 acknowledgement in response to CP transmission using PUR when connected to EPC/ 5GC. | | Yes |
| ***pur-FrequencyHopping***  Indicates whether UE supports frequency hopping for transmission using PUR. | | Yes |
| ***pur-PUSCH-NB-MaxTBS***  Indicates whether the UE supports 2984 bits max UL TBS in 1.4 MHz for transmission using PUR when operating in CE mode A, as specified in TS 36.212 [22] and TS 36.213 [23]. | | Yes |
| ***pur-RSRP-Validation***  Indicates whether UE supports serving cell RSRP for TA validation for transmission using PUR when connected to EPC/ 5GC. | | Yes |
| ***pur-SubPRB-CE-ModeA, pur-SubPRB-CE-ModeB***  Indicates whether UE supports subPRB resource allocation for PUSCH for transmission using PUR when operating in CE mode A/B. | | Yes |
| ***pur-UP-EPC-CE-ModeA, pur-UP-EPC-CE-ModeB, pur-UP-5GC-CE-ModeA, pur-UP-5GC-CE-ModeB***  Indicates whether UE operating in CE mode A/B supports UP transmission using PUR when connected to EPC/ 5GC. | | Yes |
| ***pusch-Enhancements***  Indicates whether the UE supports the PUSCH enhancement mode as specified in TS 36.211 [21] and TS 36.213 [23]. | | Yes |
| ***pusch-FeedbackMode***  Indicates whether the UE supports PUSCH feedback mode 3-2. | | No |
| ***pusch-MultiTB-CE-ModeA, pusch-MultiTB-CE-ModeB***  Indicates whether the UE supports multiple TB scheduling in connected mode for PUSCH when operating in CE mode A/B, as specified in TS 36.211 [21] and TS 36.213 [23]. | | Yes |
| ***pusch-SPS-MaxConfigSlot***  Indicates the max number of SPS configurations across all cells for slot PUSCH. | | Yes |
| ***pusch-SPS-MultiConfigSlot***  Indicates the number of multiple SPS configurations of slot PUSCH for each serving cell. | | Yes |
| ***pusch-SPS-MaxConfigSubframe***  Indicates the max number of SPS configurations across all cells for subframe PUSCH. | | Yes |
| ***pusch-SPS-MultiConfigSubframe***  Indicates the number of multiple SPS configurations of subframe PUSCH for each serving cell. | | Yes |
| ***pusch-SPS-MaxConfigSubslot***  Indicates the max number of SPS configurations across all cells for subslot PUSCH. | | - |
| ***pusch-SPS-MultiConfigSubslot***  Indicates the number of multiple SPS configurations of subslot PUSCH for each serving cell. This field is only applicable for UEs supporting FDD. | | - |
| ***pusch-SPS-SlotRepPCell***  Indicates whether the UE supports SPS repetition for slot PUSCH for PCell. | | Yes |
| ***pusch-SPS-SlotRepPSCell***  Indicates whether the UE supports SPS repetition for slot PUSCH for PSCell. | | Yes |
| ***pusch-SPS-SlotRepSCell***  Indicates whether the UE supports SPS repetition for slot PUSCH for serving cells other than SpCell. | | Yes |
| ***pusch-SPS-SubframeRepPCell***  Indicates whether the UE supports SPS repetition for subframe PUSCH for PCell. | | Yes |
| ***pusch-SPS-SubframeRepPSCell***  Indicates whether the UE supports SPS repetition for subframe PUSCH for PSCell. | | Yes |
| ***pusch-SPS-SubframeRepSCell***  Indicates whether the UE supports SPS repetition for subframe PUSCH for serving cells other than SpCell. | | Yes |
| ***pusch-SPS-SubslotRepPCell***  Indicates whether the UE supports SPS repetition for subslot PUSCH for PCell. This field is only applicable for UEs supporting FDD. | | - |
| ***pusch-SPS-SubslotRepPSCell***  Indicates whether the UE supports SPS repetition for subslot PUSCH for PSCell. This field is only applicable for UEs supporting FDD. | | - |
| ***pusch-SPS-SubslotRepSCell***  Indicates whether the UE supports SPS repetition for subslot PUSCH for serving cells other than SpCell. This field is only applicable for UEs supporting FDD. | | - |
| ***pusch-SRS-PowerControl-SubframeSet***  Indicates whether the UE supports subframe set dependent UL power control for PUSCH and SRS. This field is only applicable for UEs supporting TDD. | | Yes |
| ***qcl-CRI-BasedCSI-Reporting***  Indicates whether the UE supports CRI based CSI feedback for the FeCoMP feature as specified in TS 36.213 [23], clause 7.1.10. | | - |
| ***qcl-TypeC-Operation***  The UE uses this field to indicate the support of all of the following three features: QCL Type-C operation for FeCoMP, the capability to support separate PDSCH RE mapping for different PDSCH CWs in non-coherent joint transmission and the capability to support handling new DMRS port to MIMO layer mapping for the CWs, as specified in TS 36.213 [23], clause 7.1.10. | | - |
| ***qoe-MeasReport***  Indicates whether the UE supports QoE Measurement Collection for streaming services. | | - |
| ***qoe-MTSI-MeasReport***  Indicates whether the UE supports QoE Measurement Collection for MTSI services. | |  |
| ***rach-Less***  Indicates whether the UE supports RACH-less handover, and whether the UE which indicates *dc-Parameters* supports RACH-less SeNB change, as defined in TS 36.300 [9]. | | - |
| ***rach-Report***  Indicates whether the UE supports delivery of *rach-Report.* | | - |
| ***rai-Support***  Defines whether the UE supports release assistance indication (RAI) as specified in TS 36.321 [6] for BL UEs. | | No |
| ***rai-SupportEnh***  Indicates whether the UE supports 2-bit RAI when connected to EPC as specified in TS 36.321 [6]. | | - |
| ***rclwi***  Indicates whether the UE supports RCLWI, i.e. reception of *rclwi-Configuration*. The UE which supports RLCWI shall also indicate support of *interRAT-ParametersWLAN-r13*. The UE which supports RCLWI and *wlan-IW-RAN-Rules* shall also support applying WLAN identifiers received in *rclwi-Configuration* for the access network selection and traffic steering rules when in RRC\_IDLE. | | - |
| ***recommendedBitRate***  Indicates whether the UE supports the bit rate recommendation message from the eNB to the UE as specified in TS 36.321 [6], clause 6.1.3.13*.* | | No |
| ***recommendedBitRateMultiplier***  Indicates whether the UE supports the bit rate multiplier for recommended bit rate MAC CE as specified in TS 36.321 [6], clause 6.1.3.13. If this field is included, the UE shall also include the *recommendedBitRate* field. | | - |
| ***recommendedBitRateQuery***  Indicates whether the UE supports the bit rate recommendation query message from the UE to the eNB as specified in TS 36.321 [6], clause 6.1.3.13. If this field is included, the UE shall also include the *recommendedBitRate* field. | | No |
| ***reducedCP-Latency***  Indicates whether the UE supports reduced CP latency. | | Yes |
| ***reducedIntNonContComb***  Indicates whether the UE supports receiving *requestReducedIntNonContComb* that requests the UE to exclude supported intra-band non-contiguous CA band combinations other than included in capability signalling as specified in TS 36.306 [5], clause 4.3.5.21. | | - |
| ***reducedIntNonContCombRequested***  Indicates that the UE excluded supported intra-band non-contiguous CA band combinations other than included in capability signalling as specified in TS 36.306 [5,] clause 4.3.5.21. | | - |
| ***reflectiveQoS***  Indicates whether the UE supports AS reflective QoS. | | No |
| ***relWeightTwoLayers/ relWeightFourLayers/ relWeightEightLayers***  Indicates relative weight of processing FD-MIMO with 2/ 4/ 8 layers with respect to non-FD-MIMO with the same number of layers, see NOTE 8. Value v1 corresponds to relative weight of 1, value v1dot25 corresponds to relative weight of 1.25 and so on. This field can be included only if the UE supports the corresponding number of layers (i.e., 2/ 4/ 8 layers). | | - |
| ***reportCGI-NR-EN-DC***  Indicates whether the UE supports Inter-RAT report CGI procedure towards NR cell when it is configured with (NG)EN-DC. | | Yes |
| ***reportCGI-NR-NoEN-DC***  Indicates whether the UE supports Inter-RAT report CGI procedure towards NR cell when it is not configured with (NG)EN-DC. | | Yes |
| ***resumeWithMCG-SCellConfig***  Indicates whether the UE supports (re-)configuration of E-UTRA MCG SCells. | | - |
| ***resumeWithSCG-Config***  Indicates whether the UE supports (re-)configuration of an NR SCG. | | - |
| ***resumeWithStoredMCG-SCells***  Indicates whether the UE supports not deleting the stored E-UTRA MCG SCell configuration when initiating the resume procedure. | | - |
| ***resumeWithStoredSCG***  Indicates whether the UE supports not deleting the stored NR SCG configuration when initiating the resume procedure. | | - |
| ***srs-CapabilityPerBandPairList***  Indicates, for a particular pair of bands, the SRS carrier switching parameters when switching between the band pair to transmit SRS on a PUSCH-less SCell as specified in TS 36.212 [22] and TS 36.213 [23]. If included, the UE shall include a number of entries as indicated in the following, and listed in the same order, as in *bandParameterList* for the concerned band combination:  - For the first band, the UE shall include the same number of entries as in *bandParameterList* i.e. first entry corresponds to first band in *bandParameterList* and so on,  - For the second band, the UE shall include one entry less i.e. first entry corresponds to the second band in *bandParameterList* and so on  - And so on. | | - |
| ***requestedBands***  Indicates the frequency bands requested by E-UTRAN. | | - |
| ***requestedCCsDL, requestedCCsUL***  Indicates the maximum number of CCs requested by E-UTRAN. | | - |
| ***requestedDiffFallbackCombList***  Indicates the CA band combinations for which report of different UE capabilities is requested by E-UTRAN. | | - |
| ***rf-RetuningTimeDL***  Indicates the interruption time on DL reception within a band pair during the RF retuning for switching between the band pair to transmit SRS on a PUSCH-less SCell. n0 represents 0 OFDM symbols, n0dot5 represents 0.5 OFDM symbols, n1 represents 1 OFDM symbol and so on. This field is mandatory present if switching between the band pair is supported. | | - |
| ***rf-RetuningTimeUL***  Indicates the interruption time on UL transmission within a band pair during the RF retuning for switching between the band pair to transmit SRS on a PUSCH-less SCell. n0 represents 0 OFDM symbols, n0dot5 represents 0.5 OFDM symbols, n1 represents 1 OFDM symbol and so on. This field is mandatory present if switching between the band pair is supported. | | - |
| ***rlc-AM-Ooo-Delivery***  Indicates whether the UE supports out-of-order delivery from RLC to PDCP for RLC AM*.* | | - |
| ***rlc-UM-Ooo-Delivery***  Indicates whether the UE supports out-of-order delivery from RLC to PDCP for RLC UM*.* | | - |
| ***rlm-ReportSupport***  Indicates whether the UE supports RLM event and information reporting. | | - |
| ***rohc-ContextContinue***  Same as "*continueROHC-Context*" defined in TS 38.306 [87]. | | No |
| ***rohc-ContextMaxSessions***  Same as "*maxNumberROHC-ContextSessions*" defined in TS 38.306 [87]. | | No |
| ***rohc-Profiles***  Same as "*supportedROHC-Profiles*" defined in TS 38.306 [87]. | | No |
| ***rohc-ProfilesUL-Only***  Same as "*uplinkOnlyROHC-Profiles*" defined in TS 38.306 [87]. | | No |
| ***rsrqMeasWideband***  Indicates whether the UE can perform RSRQ measurements with wider bandwidth. | | Yes |
| ***rsrq-OnAllSymbols***  Indicates whether the UE can perform RSRQ measurement on all OFDM symbols and also support the extended RSRQ upper value range from -3dB to 2.5dB in measurement configuration and reporting as specified in TS 36.133 [16]. | | No |
| ***rs-SINR-Meas***  Indicates whether the UE can perform RS-SINR measurements in RRC\_CONNECTED as specified in TS 36.214 [48]. | | - |
| ***rssi-AndChannelOccupancyReporting***  Indicates whether the UE supports performing measurements and reporting of RSSI and channel occupancy. This field can be included only if *downlinkLAA* is included. | | - |
| ***sa-NR***  Indicates whether the UE supports standalone NR as specified in TS 38.331 [82]. | | No |
| ***scalingFactorTxSidelink, scalingFactorRxSidelink***  Indicates, for a particular band combination of EUTRA, the scaling facor, as defined in TS 38.306 [87], for the PC5 band combination(s) *v2x-SupportedBandCombinationListEUTRA-NR* on which the UE supports simultaneous transmission/reception of EUTRA and NR sidelink communication respectively, or simultaneous transmission or reception of EUTRA and joint V2X sidelink communication and NR sidelink communication respectively (as indicated by *v2x-SupportedTxBandCombListPerBC-v1630 /* *v2x-SupportedRxBandCombListPerBC-v1630*). The leading / leftmost value corresponds to the first band combination included in *v2x-SupportedBandCombinationListEUTRA-NR* which is indicated with value 1 by *v2x-SupportedTxBandCombListPerBC-v1630 /* *v2x-SupportedRxBandCombListPerBC-v1630*, the next value corresponds to the second band combination included in *v2x-SupportedBandCombinationListEUTRA-NR* which is indicated with value 1 by *v2x-SupportedTxBandCombListPerBC-v1630 /* *v2x-SupportedRxBandCombListPerBC-v1630* and so on. For each value of *ScalingFactorSidelink-r16*, value f0p4 indicates the scaling factor 0.4, f0p75 indicates 0.75, and so on. | | - |
| ***scptm-AsyncDC***  Indicates whether the UE in RRC\_CONNECTED supports MBMS reception via SC-MRB on a frequency indicated in an *MBMSInterestIndication* message, where (according to *supportedBandCombination*) the carriers that are or can be configured as serving cells in the MCG and the SCG are not synchronized. If this field is included, the UE shall also include *scptm-SCell* and *scptm-NonServingCell*. | | Yes |
| ***scptm-NonServingCell***  Indicates whether the UE in RRC\_CONNECTED supports MBMS reception via SC-MRB on a frequency indicated in an *MBMSInterestIndication* message, where (according to *supportedBandCombination* and to network synchronization properties) a serving cell may be additionally configured. If this field is included, the UE shall also include the *scptm-SCell* field. | | Yes |
| ***scptm-Parameters***  Presence of the field indicates that the UE supports SC-PTM reception as specified in TS 36.306 [5]. | | Yes |
| ***scptm-SCell***  Indicates whether the UE in RRC\_CONNECTED supports MBMS reception via SC-MRB on a frequency indicated in an *MBMSInterestIndication* message, when an SCell is configured on that frequency (regardless of whether the SCell is activated or deactivated). | | Yes |
| ***scptm-ParallelReception***  Indicates whether the UE in RRC\_CONNECTED supports parallel reception in the same subframe of DL-SCH transport blocks transmitted using C-RNTI/Semi-Persistent Scheduling C-RNTI and using SC-RNTI/G-RNTI as specified in TS 36.306 [5]. | | Yes |
| ***secondSlotStartingPosition***  Indicates whether the UE supports reception of subframes with second slot starting position as described in TS 36.211 [21] and TS 36.213 [23]. This field can be included only if *downlinkLAA* is included. | | - |
| ***semiOL***  Indicates whether the UE supports semi-open-loop transmission for the indicated transmission mode. | | Yes |
| ***semiStaticCFI***  Indicates whether the UE supports the semi-static configuration of CFI for subframe/slot/sub-slot operation. | | Yes |
| ***semiStaticCFI-Pattern***  Indicates whether the UE supports the semi-static configuration of CFI pattern for subframe/slot/sub-slot operation. This field is only applicable for UEs supporting TDD. | | - |
| ***sharedSpectrumMeasNR-EN-DC***  Indicates whether the UE supports performing measurements and reporting of RSSI and channel occupancy on each supported NR band in EN-DC. If included, the UE shall include the same number of entries, and listed in the same order as in *supportedBandListEN-DC-r15*. | | - |
| ***sharedSpectrumMeasNR-SA***  Indicates whether the UE supports performing measurements and reporting of RSSI and channel occupancy on each supported NR band in NR SA. If included, the UE shall include the same number of entries, and listed in the same order as in *supportedBandListNR-SA-r15*. | | - |
| ***shortCQI-ForSCellActivation***  Indicates whether the UE supports additional CQI reporting periodicity after SCell activation. | | Yes |
| ***shortMeasurementGap*** Indicates whether the UE supports shorter measurement gap length (i.e. *gp2* and *gp3*) in LTE standalone as specified in TS 36.133 [16], and for independent measurement gap configuration on FR1 and per-UE gap in (NG)EN-DC as specified in TS38.133 [84]. | | No |
| ***shortSPS-IntervalFDD***  Indicates whether the UE supports uplink SPS intervals shorter than 10 subframes in FDD mode. | | - |
| ***shortSPS-IntervalTDD***  Indicates whether the UE supports uplink SPS intervals shorter than 10 subframes in TDD mode. | | - |
| ***simultaneousPUCCH-PUSCH***  Indicates whether the UE supports simultaneous transmission of PUSCH/PUCCH and SlotOrSubslotPUSCH/SPUCCH (if supported). | | Yes |
| ***simultaneousRx-Tx***  Indicates whether the UE supports simultaneous reception and transmission on different bands for each band combination listed in *supportedBandCombination*. This field is only applicable for inter-band TDD band combinations. A UE indicating support of *simultaneousRx-Tx* and *dc-Support-r12* shall support different UL/DL configurations between PCell and PSCell. | | - |
| ***simultaneousTx-DifferentTx-Duration***  Indicates whether the UE supports simultaneous transmission of different transmission durations over different carriers. The different transmission durations can be of subframe, slot or subslot duration. | | - |
| ***skipFallbackCombinations***  Indicates whether UE supports receiving *requestSkipFallbackComb* that requests UE to exclude fallback band combinations from capability signalling. | | - |
| ***skipFallbackCombRequested***  Indicates whether *requestSkipFallbackComb* is requested by E-UTRAN. | | - |
| ***skipMonitoringDCI-Format0-1A***  Indicates whether UE supports blind decoding reduction on UE specific search space by not monitoring DCI Format 0 and 1A as specified in TS 36.213 [23], clause 9.1.1. | | No |
| ***skipSubframeProcessing***  This fields defines whether the UE supports aborting reception of PDSCH if the UE receives slot-PDSCH/subslot-PDSCH during an ongoing PDSCH reception and instead starts receiving the slot-PDSCH/subslot-PDSCH, as well as whether the UE supports aborting a PUSCH transmission if the UE gets a grant for a slot-PUSCH/ subslot-PUSCH transmission that overlaps with a grant received for a PUSCH transmission. The capability indicates the number of subframes that the UE may drop prior to the subframe in which it prioritizes the processing of slot/subslot PDSCH/PUSCH as described in TS 36.213 [23], clauses 7.1 and 8.0. Separate capability for UL and DL and per sTTI length in each direction*: skipProcessingDL-Slot, skipProcessingDL-Subslot, skipProcessingUL-Slot* and *skipProcessingUL-Subslot.* | | - |
| ***skipUplinkDynamic***  Indicates whether the UE supports skipping of UL transmission for an uplink grant indicated on PDCCH if no data is available for transmission as described in TS 36.321 [6]. | | - |
| ***skipUplinkSPS***  Indicates whether the UE supports skipping of UL transmission for a configured uplink grant if no data is available for transmission as described in TS 36.321 [6]. | | - |
| ***sl-64QAM-Rx***  Indicates whether the UE supports 64QAM for the reception of V2X sidelink communication. | | - |
| ***sl-64QAM-Tx***  Indicates whether the UE supports 64QAM for the transmission of V2X sidelink communication. | | - |
| ***sl-CongestionControl***  Indicates whether the UE supports Channel Busy Ratio measurement and reporting of Channel Busy Ratio measurement results to eNB for V2X sidelink communication. | | - |
| ***sl-LowT2min***  Indicates whether the UE supports 10ms as minimum value of T2 for resource selection procedure of V2X sidelink communication. | | - |
| ***sl-ParameterNR***  Includes the *SidelinkParametersNR* IE as specified in TS 38.331 [82]. The field includes the sidelink capability for NR-PC5, where *multipleSR-ConfigurationsSidelink* and *logicalChannelSR-DelayTimerSidelink* is not applicable. | | - |
| ***sl-RateMatchingTBSScaling***  Indicates whether the UE supports rate matching and TBS scalling for V2X sidelink communication. | | - |
| ***slotPDSCH-TxDiv-TM8***  Indicates whether the UE supports TX diversity transmission using ports 7 and 8 for TM8 for slot PDSCH. | | - |
| ***slotPDSCH-TxDiv-TM9and10***  Indicates whether the UE supports TX diversity transmission using ports 7 and 8 for TM9/10 for slot PDSCH. | | Yes |
| ***slotSymbolResourceResvDL-CE-ModeA, slotSymbolResourceResvDL-CE-ModeB, slotSymbolResourceResvUL-CE-ModeA, slotSymbolResourceResvUL-CE-ModeB***  Indicates whether the UE supports slot/symbol-level time-domain resource reservation in downlink/uplink when operating in CE mode A/B, as specified in TS 36.211 [21] and TS 36.213 [23]. | | Yes |
| ***slss-SupportedTxFreq***  Indicates whether the UE supports the SLSS transmission on single carrier or on multiple carriers in the case of sidelink carrier aggregation. | | - |
| ***slss-TxRx***  Indicates whether the UE supports SLSS/PSBCH transmission and reception in UE autonomous resource selection mode and eNB scheduled mode in a band for V2X sidelink communication. | | - |
| ***sl-TxDiversity***  Indicates whether the UE supports transmit diversity for V2X sidelink communication. See TS 36.101 [42]. | | - |
| ***sn-SizeLo***  Same as "*shortSN*" defined in TS 38.306 [87]. | | No |
| ***spatialBundling-HARQ-ACK***  Indicates whether UE supports HARQ-ACK spatial bundling on PUCCH or PUSCH as specified in TS 36.213 [23], clauses 7.3.1 and 7.3.2. | | No |
| ***spdcch-differentRS-types***  Indicates whether the UE supports monitoring of sPDCCH on RB sets with different RS types within a TTI. | | Yes |
| ***spdcch-Reuse***  Indicates whether the UE supports L1 based SPDCCH reuse. | | Yes |
| ***sps-CyclicShift***  Indicates whether the UE supports RRC configuration of cyclic shift for DMRS for UL SPS using 1ms TTI. | | Yes |
| ***sps-ServingCell***  Indicates whether the UE supports multiple UL/DL SPS configurations simultaneously active on different serving cells as specified in TS 36.321 [6]. | | - |
| ***sps-STTI***  Indicates whether the UE supports SPS in DL and/or UL for slot or subslot based PDSCH and PUSCH, respectively. | | Yes |
| ***srs-DCI7-TriggeringFS2***  Indicates whether the UE supports SRS triggerring via DCI format 7 for FS2. | | - |
| ***srs-Enhancements***  Indicates whether the UE supports SRS enhancements. | | Yes |
| ***srs-EnhancementsTDD***  Indicates whether the UE supports TDD specific SRS enhancements. | | Yes |
| ***srs-FlexibleTiming***  Indicates whether the UE supports configuration of *soundingRS-FlexibleTiming-r14* for the corresponding band pair. For a TDD-TDD band pair, UE shall include at least one of *srs-FlexibleTiming* and/or *srs-HARQ-ReferenceConfig* when *rf-RetuningTimeDL* or *rf-RetuningTimeUL* corresponding to the band pair is larger than 1 OFDM symbol. | | - |
| ***srs-HARQ-ReferenceConfig***  Indicates whether the UE supports configuration of *harq-ReferenceConfig-r14* for the corresponding band pair. For a TDD-TDD band pair, UE shall include at least one of *srs-FlexibleTiming* and/or *srs-HARQ-ReferenceConfig* when *rf-RetuningTimeDL* or *rf-RetuningTimeUL* corresponding to the band pair is larger than 1 OFDM symbol. | | - |
| ***srs-MaxSimultaneousCCs***  Indicates the maximum number of simultaneously configurable target CCs for SRS switching (i.e., CCs for which srs-SwitchFromServCellIndex is configured) supported by the UE. | | - |
| ***srs-UpPTS-6sym***  Indicates whether the UE supports up to 6-symbol SRS in UpPTS. | | - |
| ***srvcc-FromUTRA-FDD-ToGERAN***  Indicates whether UE supports SRVCC handover from UTRA FDD PS HS to GERAN CS. | | - |
| ***srvcc-FromUTRA-FDD-ToUTRA-FDD***  Indicates whether UE supports SRVCC handover from UTRA FDD PS HS to UTRA FDD CS. | | - |
| ***srvcc-FromUTRA-TDD128-ToGERAN***  Indicates whether UE supports SRVCC handover from UTRA TDD 1.28Mcps PS HS to GERAN CS. | | - |
| ***srvcc-FromUTRA-TDD128-ToUTRA-TDD128***  Indicates whether UE supports SRVCC handover from UTRA TDD 1.28Mcps PS HS to UTRA TDD 1.28Mcps CS. | | - |
| ***ss-CCH-InterfHandl***  Indicates whether the UE supports synchronisation signal and common channel interference handling. | | Yes |
| ***ss-SINR-Meas-NR-FR1, ss-SINR-Meas-NR-FR2***  Indicates whether the UE can perform NR SS-SINR measurement for a frequency range (i.e. FR1 or FR2) as specified in TS 38.215 [89]. | | - |
| ***ssp10-TDD-Only***  Indicates the UE supports special subframe configuration 10 when operating only in TDD carriers (i.e., not in TDD/FDD CA or TDD/FS3 CA). A UE including this field shall not include *tdd-SpecialSubframe-r14*. | | - |
| ***standaloneGNSS-Location***  Indicates whether the UE is equipped with a standalone GNSS receiver that may be used to provide detailed location information in RRC measurement report and logged measurements. | | - |
| ***sTTI-SPT-Supported***  Indicates whether the UE supports the features STTI and/or SPT. If the UE supports STTI and/or SPT features, the UE shall report the field *sTTI-SPT-Supported* set to *supported* in capability signalling, irrespective of whether *requestSTTI-SPT-Capability* field is present or not. | | - |
| ***sTTI-FD-MIMO-Coexistence***  Indicates whether the UE supports CSI feedback for more than 8 NZP CSI-RS ports on subframe based PUSCH in any serving cell and supporting STTI in any serving cell. | | - |
| ***sTTI-SupportedCombinations***  Indicates the different combinations of short TTI lengths, see field description for *dl-STTI-Length* and *ul-STTI-Length*, that the UE supports in a single PUCCH group or in two PUCCH groups. A short TTI length combination is reported for DL first followed by UL. In case of two PUCCH groups the support for the primary PUCCH group is indicated first. | | - |
| ***subcarrierPuncturingCE-ModeA, subcarrierPuncturingCE-ModeB***  Indicates whether the UE supports subcarrier puncturing in downlink when operating in CE mode A/B, as specified in TS 36.211 [21] and TS 36.213 [23]. | | Yes |
| ***subcarrierSpacingMBMS-khz7dot5, subcarrierSpacingMBMS-khz1dot25***  Indicates the supported subcarrier spacings for MBSFN subframes in addition to 15 kHz subcarrier spacing. *subcarrierSpacingMBMS-khz1dot25* and *subcarrierSpacingMBMS-khz7dot5* indicates that the UE supports 1.25 and 7.5 kHz respectively for MBSFN subframes as described in TS 36.211 [21], clause 6.12. This field is included only if *fembmsMixedCell* or *fembmsDedicatedCell* is included. | | - |
| ***subcarrierSpacingMBMS-khz2dot5, subcarrierSpacingMBMS-khz0dot37***  Presence of this field indicates the supported subcarrier spacings of 2.5kHz / 0.37kHz for MBSFN subframes in addition to 15 kHz subcarrier spacing when operating on the E-UTRA band given by the entry in *mbms-SupportedBandInfoList* as described in TS 36.211 [21], clause 6.12. | | - |
| ***subframeResourceResvDL-CE-ModeA, subframeResourceResvDL-CE-ModeB, subframeResourceResvUL-CE-ModeA, subframeResourceResvUL-CE-ModeB***  Indicates whether the UE supports Subframe-level time-domain resource reservation in downlink/uplink when operating in CE mode A/B, as specified in TS 36.211 [21] and TS 36.213 [23]. | | Yes |
| ***subslotPDSCH-TxDiv-TM9and10***  Indicates whether the UE supports TX diversity transmission using ports 7 and 8 for TM9/10 for subslot PDSCH. | | Yes |
| ***supportedBandCombination***  Includes the supported CA band combinations, if any, and may include all the supported non-CA bands. | | - |
| ***supportedBandCombinationAdd-r11***  Includes additional supported CA band combinations in case maximum number of CA band combinations of *supportedBandCombination* is exceeded. | | - |
| ***SupportedBandCombinationAdd-v11d0,*** ***SupportedBandCombinationAdd-v1250,*** ***SupportedBandCombinationAdd-v1270, SupportedBandCombinationAdd-v1320, SupportedBandCombinationAdd-v1380, SupportedBandCombinationAdd-v1390, SupportedBandCombinationAdd-v1430, SupportedBandCombinationAdd-v1450, SupportedBandCombinationAdd-v1470, SupportedBandCombinationAdd-v14b0, SupportedBandCombinationAdd-v1530, SupportedBandCombinationAdd-v1630***  If included, the UE shall include the same number of entries, and listed in the same order, as in *SupportedBandCombinationAdd-r11*. | | - |
| ***SupportedBandCombinationAdd-v1610***  If included, the UE shall include the same number of entries, and listed in the same order, as in *SupportedBandCombinationAdd-r11*. If absent, network assumes gap is required when measurement is performed on any NR bands while UE is served by cell(s) belongs to an E-UTRA CA band combinations listed in *SupportedBandCombinationAdd-r11* except for the FR2 inter-RAT measurement which depends on the support of *independentGapConfig.* | | - |
| ***SupportedBandCombinationExt, SupportedBandCombination-v1090, SupportedBandCombination-v10i0, SupportedBandCombination-v1130, SupportedBandCombination-v1250, SupportedBandCombination-v1270, SupportedBandCombination-v1320, SupportedBandCombination-v1380, SupportedBandCombination-v1390, SupportedBandCombination-v1430, SupportedBandCombination-v1450, SupportedBandCombination-v1470, SupportedBandCombination-v14b0, SupportedBandCombination-v1530, SupportedBandCombination-v1630***  If included, the UE shall include the same number of entries, and listed in the same order, as in *supportedBandCombination-r10*. | | - |
| ***SupportedBandCombination-v1610***  If included, the UE shall include the same number of entries, and listed in the same order, as in *supportedBandCombination-r10*. If absent, network assumes gap is required when measurement is performed on any NR bands while UE is served by cell(s) belongs to an E-UTRA CA band combinations listed in *supportedBandCombination-r10* except for the FR2 inter-RAT measurement which depends on the support of *independentGapConfig.* | | - |
| ***supportedBandCombinationReduced***  Includes the supported CA band combinations, and may include the fallback CA combinations specified in TS 36.101 [42], clause 4.3A. This field also indicates whether the UE supports reception of *requestReducedFormat*. | | - |
| ***SupportedBandCombinationReduced-v1320, SupportedBandCombinationReduced-v1380, SupportedBandCombinationReduced-v1390, SupportedBandCombinationReduced-v1430, SupportedBandCombinationReduced-v1450, SupportedBandCombinationReduced-v1470, SupportedBandCombinationReduced-v14b0, SupportedBandCombinationReduced-v1530, SupportedBandCombinationReduced-v1630***  If included, the UE shall include the same number of entries, and listed in the same order, as in *supportedBandCombinationReduced-r13*. | | - |
| ***SupportedBandCombinationReduced-v1610***  If included, the UE shall include the same number of entries, and listed in the same order, as in *supportedBandCombinationReduced-r13*. If absent, network assumes gap is required when measurement is performed on any NR bands while UE is served by cell(s) belongs to an E-UTRA CA band combinations listed in *supportedBandCombinationReduced-r13* except for the FR2 inter-RAT measurement which depends on the support of *independentGapConfig.* | | - |
| ***SupportedBandGERAN***  GERAN band as defined in TS 45.005 [20]. | | No |
| ***SupportedBandList1XRTT***  One entry corresponding to each supported CDMA2000 1xRTT band class. | | - |
| ***SupportedBandListEUTRA***  Includes the supported E-UTRA bands. This field shall include all bands which are indicated in *BandCombinationParameters*. | | - |
| ***SupportedBandListEUTRA-v9e0, SupportedBandListEUTRA-v1250, SupportedBandListEUTRA-v1310, SupportedBandListEUTRA-v1320***  If included, the UE shall include the same number of entries, and listed in the same order, as in *supportedBandListEUTRA* (i.e. without suffix). | | - |
| ***SupportedBandListGERAN*** | | No |
| ***SupportedBandListHRPD***  One entry corresponding to each supported CDMA2000 HRPD band class. | | - |
| ***SupportedBandListNR-SA***  Includes the NR bands supported by the UE in NR-SA (for handover and redirection). The field is included in case the UE supports NR SA as specified in TS 38.331 [32] and not otherwise. The presence of this field also indicates that the UE can perform both NR SS-RSRP and SS-RSRQ measurement in the included NR band(s) as specified in TS 38.215 [89]. | | No |
| ***supportedBandListEN-DC***  Includes the NR bands supported by the UE in (NG)EN-DC. The field is included in case the parameter *en-DC* or *ng-EN-DC* is present and set to *supported* and not otherwise. The presence of this field also indicates that the UE can perform both NR SS-RSRP and SS-RSRQ measurement in the included NR band(s) as specified in TS 38.215 [89]. | | - |
| ***supportedBandListWLAN***  Indicates the supported WLAN bands by the UE. | | - |
| ***SupportedBandUTRA-FDD***  UTRA band as defined in TS 25.101 [17]. | | - |
| ***SupportedBandUTRA-TDD128***  UTRA band as defined in TS 25.102 [18]. | | - |
| ***SupportedBandUTRA-TDD384***  UTRA band as defined in TS 25.102 [18]. | | - |
| ***SupportedBandUTRA-TDD768***  UTRA band as defined in TS 25.102 [18]. | | - |
| ***supportedBandwidthCombinationSet***  The *supportedBandwidthCombinationSet* indicated for a band combination is applicable to all bandwidth classes indicated by the UE in this band combination.  Field encoded as a bit map, where bit N is set to "1" if UE support Bandwidth Combination Set N for this band combination, see 36.101 [42]. The leading / leftmost bit (bit 0) corresponds to the Bandwidth Combination Set 0, the next bit corresponds to the Bandwidth Combination Set 1 and so on. The UE shall neither include the field for a non-CA band combination, nor for a CA band combination for which the UE only supports Bandwidth Combination Set 0. | | - |
| ***supportedCellGrouping***  This field indicates for which mapping of serving cells to cell groups (i.e. MCG or SCG) the UE supports asynchronous DC. This field is only present for a band combination with more than two but less than six band entries where the UE supports asynchronous DC. If this field is not present but asynchronous operation is supported, the UE supports all possible mappings of serving cells to cell groups for the band combination. The bitmap size is selected based on the number of entries in the combinations, i.e., in case of three entries, the bitmap corresponding to *threeEntries* is selected and so on.  A bit in the bit string set to 1 indicates that the UE supports asynchronous DC for the cell grouping option represented by the concerned bit position. Each bit position represents a different cell grouping option, as illustrated by a table, see NOTE 5. A cell grouping option is represented by a number of bits, each representing a particular band entry in the band combination with the left-most bit referring to the band listed first in the band combination, etc. Value 0 indicates that the carriers of the corresponding band entry are mapped to a first cell group, while value 1 indicates that the carriers of the corresponding band entry are mapped to a second cell group.  It is noted that the mapping table does not include entries with all bits set to the same value (0 or 1) as this does not represent a DC scenario (i.e. indicating that the UE supports that all carriers of the corresponding band entry are in one cell group). | | - |
| ***supportedCSI-Proc, sTTI-SupportedCSI-Proc***  Indicates the maximum number of CSI processes supported on a component carrier within a band. Value n1 corresponds to 1 CSI process, value n3 corresponds to 3 CSI processes, and value n4 corresponds to 4 CSI processes. If this field is included, the UE shall include the same number of entries listed in the same order as in *BandParameters/STTI-SPT-BandParameters*. If the UE supports at least 1 CSI process on any component carrier, then the UE shall include this field in all bands in all band combinations. | | - |
| ***supportedCSI-Proc (in FeatureSetDL-PerCC)***  In MR-DC, indicates the number of CSI processes for the component carrier in the corresponding bandwidth class. If the UE supports at least 1 CSI process, then the UE shall include this field. | | - |
| ***supportedMIMO-CapabilityDL-MRDC (in FeatureSetDL-PerCC)***  In MR-DC, indicates the maximum number of supported layers in TM9/10 for the component carrier in the corresponding bandwidth class. | | - |
| ***supportedNAICS-2CRS-AP***  If included, the UE supports NAICS for the band combination. The UE shall include a bitmap of the same length, and in the same order, as in *naics-Capability-List,* to indicate 2 CRS AP NAICS capability of the band combination. The first/ leftmost bit points to the first entry of *naics-Capability-List*, the second bit points to the second entry of *naics-Capability-List*, and so on.  For band combinations with a single component carrier, UE is only allowed to indicate {*numberOfNAICS-CapableCC*, *numberOfAggregatedPRB*} = {1, 100} if NAICS is supported. | | - |
| ***supportedOperatorDic***  Indicates whether the UE supports operator defined dictionary. If UE supports operator defined dictionary, the UE shall report *versionOfDictionary* and *associatedPLMN-ID* of the stored operator defined dictionary. This parameter is not required to be present if the UE is in VPLMN. In this release of the specification, UE can only support one operator defined dictionary. The *associatedPLMN-ID* is only associated to the operator defined dictionary which has no relationship with UE's HPLMN ID. | | - |
| ***supportRohcContextContinue***  Indicates whether the UE supports ROHC context continuation operation where the UE does not reset the current ROHC context upon handover. | | - |
| ***supportedROHC-Profiles***  Indicates the ROHC profiles that UE supports in both uplink and downlink. | | - |
| ***supportedUplinkOnlyROHC-Profiles***  Indicates the ROHC profiles that UE supports in uplink and not in downlink, see TS 36.323 [8] | | - |
| ***supportedStandardDic***  Indicates whether the UE supports standard dictionary for SIP and SDP as specified in TS 36.323 [8]. | | - |
| ***supportedUDC***  Indicates whether the UE supports UL data compression, see TS 36.323 [8]. | | - |
| ***tdd-SpecialSubframe***  Indicates whether the UE supports TDD special subframe defined in TS 36.211 [21]. A UE shall indicate *tdd-SpecialSubframe-r11* if it supports the TDD special subframes ssp7 and ssp9. A UE shall indicate *tdd-SpecialSubframe-r14* if it supports the TDD special subframe ssp10, except when *ssp10-TDD-Only-r14* is included. | | Yes |
| ***tdd-FDD-CA-PCellDuplex***  The presence of this field indicates that the UE supports TDD/FDD CA in any supported band combination including at least one FDD band with *bandParametersUL* and at least one TDD band with *bandParametersUL*. The first bit is set to "1" if UE supports the TDD PCell. The second bit is set to "1" if UE supports FDD PCell. This field is included only if the UE supports band combination including at least one FDD band with *bandParametersUL* and at least one TDD band with *bandParametersUL*. If this field is included, the UE shall set at least one of the bits as "1". If this field is included with DC, then it is applicable within a CG, and the presence of this field indicates the capability of the UE to support TDD/FDD CA with at least one FDD band and at least one TDD band in the same CG, with the value indicating the support for TDD/FDD PCell (PSCell). | | No |
| ***tdd-TTI-Bundling***  The presence of this field indicates whether the UE supporting TDD special subframe configuration 10 also supports TTI bundling for TDD configuration 2 and 3 when PUSCH transimission in UpPTS is configured, see TS 36.213 [23], clause 8.0. If this field is present, the *tdd-SpecialSubframe-r14* or *ssp10-TDD-Only-r14* shall be present. | | Yes |
| ***timeReferenceProvision***  Indicates whether the UE supports provision of time reference in *DLInformationTransfer* message. | | - |
| ***timeSeparationSlot2, timeSeparationSlot4***  Indicates whether the UE supports time staggering length of 2 slots (MBSFN reference signal pattern type 2) / 4 slots (MBSFN reference signal pattern type 1) for MBSFN-RS associated with PMCH with subcarrier spacing of 0.37 kHz for MBSFN subframes when operating on the E‑UTRA band given by the entry in *mbms-SupportedBandInfoList* as described in TS 36.211 [21], clause 6.10.2.2.4. | | - |
| ***timerT312***  Indicates whether the UE supports T312. | | No |
| ***tm5-FDD***  Indicates whether the UE supports the PDSCH transmission mode 5 in FDD. | | - |
| ***tm5-TDD***  Indicates whether the UE supports the PDSCH transmission mode 5 in TDD. | | - |
| ***tm6-CE-ModeA***  Indicates whether the UE supports tm6 operation in CE mode A, see TS 36.213 [23], clause 7.2.3. This field can be included only if *ce-ModeA* is included. | | Yes |
| ***tm8-slotPDSCH***  Indicates whether the UE supports configuration and decoding of TM8 for slot PDSCH in TDD. | | - |
| ***tm9-CE-ModeA***  Indicates whether the UE supports tm9 operation in CE mode A, see TS 36.213 [23], clause 7.2.3. This field can be included only if *ce-ModeA* is included. | | Yes |
| ***tm9-CE-ModeB***  Indicates whether the UE supports tm9 operation in CE mode B, see TS 36.213 [23], clause 7.2.3. This field can be included only if *ce-ModeB* is included. | | Yes |
| ***tm9-LAA***  Indicates whether the UE supports tm9 operation on LAA cell(s). This field can be included only if *downlinkLAA* is included. | | - |
| ***tm9-slotSubslot***  Indicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot PDSCH for non-MBSFN. | | Yes |
| ***tm9-slotSubslotMBSFN***  Indicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot PDSCH for MBSFN. | | Yes |
| ***tm9-With-8Tx-FDD***  Indicates whether the UE supports PDSCH transmission mode 9 with 8 CSI reference signal ports for FDD when not operating in CE mode. | | Yes |
| ***tm10-LAA***  Indicates whether the UE supports tm10 operation on LAA cell(s). This field can be included only if *downlinkLAA* is included. | | - |
| ***tm10-slotSubslot***  Indicates whether the UE supports configuration and decoding of TM10 for slot and/or subslot PDSCH for non-MBSFN. | | Yes |
| ***tm10-slotSubslotMBSFN***  Indicates whether the UE supports configuration and decoding of TM10 for slot and/or subslot PDSCH for MBSFN. | | Yes |
| ***totalWeightedLayers***  Indicates total number of weighted layers the UE can process for FD-MIMO. See NOTE 8. | | - |
| ***twoAntennaPortsForPUCCH*** | | No |
| ***twoStepSchedulingTimingInfo***  Presence of this field indicates that the UE supports uplink scheduling using PUSCH trigger A and PUSCH trigger B (as defined in TS 36.213 [23]).  This field also indicates the timing between the PUSCH trigger B and the earliest time the UE supports performing the associated UL transmission. For reception of PUSCH trigger B in subframe N, value *nPlus1* indicates that the UE supports performing the UL transmission in subframe N+1, value *nPlus2* indicates that the UE supports performing the UL transmission in subframe N+2, and so on.  This field can be included only if *uplinkLAA* is included. | | - |
| ***txAntennaSwitchDL, txAntennaSwitchUL***  The presence of *txAntennaSwitchUL* indicates the UE supports transmit antenna selection for this UL band in the band combination as described in TS 36.213 [23], clauses 8.2 and 8.7.  The field *txAntennaSwitchDL* indicates the entry number of the first-listed band with UL in the band combination that affects this DL. The field *txAntennaSwitchUL* indicates the entry number of the first-listed band with UL in the band combination that switches together with this UL. Value 1 means first entry, value 2 means second entry and so on. All DL and UL that switch together indicate the same entry number.  For the case of carrier switching, the antenna switching capability for the target carrier configuration is indicated as follows:  For UE configured with a set of component carriers belonging to a band combination Cbaseline = {b1(1),…,bx(1),…,by(0),…}, where "1/0" denotes whether the corresponding band has an uplink, if a component carrier in bx is to be switched to a component carrier in by (according to *srs-SwitchFromServCellIndex*), the antenna switching capability is derived based on band combination Ctarget = {b1(1),…,bx(0),…,by(1),…}. | | - |
| ***txDiv-PUCCH1b-ChSelect***  Indicates whether the UE supports transmit diversity for PUCCH format 1b with channel selection. | | Yes |
| ***txDiv-SPUCCH***  Indicates whether the UE supports Tx diversity on SPUCCH format 1/1a/1b/3. | | Yes |
| ***tx-Sidelink, rx-Sidelink***  Indicates that the UE supports sidelink transmission/reception on the band in the band combination.  For NR sidelink transmission, *tx-Sidelink* is only applicable if the UE supports at least one of *sl-TransmissionMode1-r16* and *sl-TransmissionMode2-r16* on the band as specified in TS 38.331 [82].  For NR sidelink reception, *rx-Sidelink* is only applicable if the UE supports *sl-Reception-r16* on the band as specified in TS 38.331 [82]. | | - |
| ***uci-PUSCH-Ext***  Indicates whether the UE supports an extension of UCI delivering more than 22 HARQ-ACK bits on PUSCH as specified in TS 36.212 [22], clause 5.2.2.6 and TS 36.213 [23], clause 8.6.3. | | No |
| ***ue-AutonomousWithFullSensing***  Indicates whether the UE supports transmitting PSCCH/PSSCH using UE autonomous resource selection mode with full sensing (i.e., continuous channel monitoring) for V2X sidelink communication and the UE supports maximum transmit power associated with Power class 3 V2X UE, see TS 36.101 [42]. | | - |
| ***ue-AutonomousWithPartialSensing***  Indicates whether the UE supports transmitting PSCCH/PSSCH using UE autonomous resource selection mode with partial sensing (i.e., channel monitoring in a limited set of subframes) for V2X sidelink communication and the UE supports maximum transmit power associated with Power class 3 V2X UE, see TS 36.101 [42]. | | - |
| ***ue-Category***  UE category as defined in TS 36.306 [5]. Set to values 1 to 12 in this version of the specification. | | - |
| ***ue-CategoryDL***  UE DL category as defined in TS 36.306 [5]. Value *n17* corresponds to UE category 17, value *m1* corresponds to UE category M1, value *oneBis* corresponds to UE category 1bis, value m2 corresponds to UE category M2. For ASN.1 compatibility, a UE indicating DL category 0, m1 or m2 shall also indicate any of the categories (1..5) in *ue-Category* (without suffix), which is ignored by the eNB, a UE indicating UE category oneBis shall also indicate UE category 1 in *ue-Category* (without suffix), and a UE indicating UE category m2 shall also indicate UE category m1. The field *ue-CategoryDL* is set to values 0, m1, oneBis, m2, 4, 6, 7, 9 to 16, n17, 18, 19, 20, 21, 22, 23, 24, 25, 26 in this version of the specification. | | - |
| ***ue-CategorySL-C-TX***  UE SL category for V2X transmission as defined in TS 36.306 [5]. Set to values 1 to 5 in this version of the specification. | | - |
| ***ue-CategorySL-C-RX***  UE SL category for V2X reception as defined in TS 36.306 [5]. Set to values 1 to 4 in this version of the specification. | | - |
| ***ue-CategoryUL***  UE UL category as defined in TS 36.306 [5]. Value *n14* corresponds to UE category 14, value *n16* corresponds to UE category 16 and so on. Value *m1* corresponds to UE category M1, value *m2* corresponds to UE category M2, value *oneBis* corresponds to UE category 1bis. The field *ue-CategoryUL* is set to values m1, m2, 0, oneBis, 3, 5, 7, 8, 13, n14, 15, n16 to n21 or 22 to 26 in this version of the specification. | | - |
| ***ue-CA-PowerClass-N***  Indicates whether the UE supports UE power class N in the E-UTRA band combination, see TS 36.101 [42] and TS 36.307 [78]. If *ue-CA-PowerClass-N* is not included, UE supports the default UE power class in the E-UTRA band combination, see TS 36.101 [42]. | | - |
| ***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]. | | - |
| ***ue-PowerClass-N, ue-PowerClass-5***  Indicates whether the UE supports UE power class 1, 2, 4 or 5 in the E-UTRA band, see TS 36.101 [42] and TS 36.307 [79]. UE includes either *ue-PowerClass-N* or *ue-PowerClass-5*. If neither *ue-PowerClass-N* nor *ue-PowerClass-5* is included, UE supports the default UE power class in the E-UTRA band, see TS 36.101 [42]. | | - |
| ***ue-Rx-TxTimeDiffMeasurements***  Indicates whether the UE supports Rx - Tx time difference measurements. | | No |
| ***ue-SpecificRefSigsSupported*** | | No |
| ***ue-SSTD-Meas***  Indicates whether the UE supports SSTD measurements between the PCell and the PSCell as specified in TS 36.214 [48] and TS 36.133 [16]. | | - |
| ***ue-TxAntennaSelectionSupported***  Except for the supported band combinations for which *bandParameterList-v1380* is included, TRUE indicates that the UE is capable of supporting UE transmit antenna selection such that all the supported bands in the band combination are affected by transmit antenna switching, as described in TS 36.213 [23], clause 8.7. E-UTRAN ignores this field for band combinations for which *bandParameterList-v1380* is included. | | Yes |
| ***ue-TxAntennaSelection-SRS-1T4R***  Indicates whether the UE supports selecting one antenna among four antennas to transmit SRS for the corresponding band of the band combination as described in TS 36.213 [23]. | | - |
| ***ue-TxAntennaSelection-SRS-2T4R-2Pairs***  Indicates whether the UE supports selecting one antenna pair between two antenna pairs to transmit SRS simultaneously for the corresponding band of the band combination as described in TS 36.213 [23]. | | - |
| ***ue-TxAntennaSelection-SRS-2T4R-3Pairs***  Indicates whether the UE supports selecting one antenna pair among three antenna pairs to transmit SRS simultaneously for the corresponding band of the band combination as described in TS 36.213 [23]. | | - |
| ***ul-64QAM***  Indicates whether the UE supports 64QAM in UL on the band. This field is only present when the field ue*-CategoryUL* indicates UL UE category that supports UL 64QAM, see TS 36.306 [5], Table 4.1A-2. If the field is present for one band, the field shall be present for all bands including downlink only bands. | | - |
| ***ul-256QAM***  Indicates whether the UE supports 256QAM in UL on the band in the band combination. This field is only present when the field ue*-CategoryUL* indicates UL UE category that supports 256QAM in UL, see TS 36.306 [5], Table 4.1A-2. The UE includes this field only if the field *ul-256QAM-perCC-InfoLis*t is not included. | | - |
| ***ul-256QAM (in FeatureSetUL-PerCC)***  Indicates whether the UE supports 256QAM in UL for MR-DC within the indicated feature set. This field is only present when the field ue-CategoryUL indicates UL UE category that supports 256QAM in UL, see TS 36.306 [5], Table 4.1A-2. | | - |
| ***ul-256QAM-perCC-InfoList***  Indicates, per serving carrier of which the corresponding bandwidth class includes multiple serving carriers (i.e. bandwidth class B, C, D and so on), whether the UE supports 256QAM in the band combination. The number of entries is equal to the number of component carriers in the corresponding bandwidth class. The UE shall support the setting indicated in each entry of the list regardless of the order of entries in the list. This field is only present when the field *ue-CategoryUL* indicates UL UE category that supports 256QAM in UL, see TS 36.306 [5], Table 4.1A-2. The UE includes this field only if the field *ul-256QAM* is not included. | | - |
| ***ul-256QAM-Slot***  Indicates whether the UE supports 256QAM in UL for slot TTI operation on the band. | | - |
| ***ul-256QAM-Subslot***  Indicates whether the UE supports 256QAM in UL for subslot TTI operation on the band. | | - |
| ***ul-AsyncHarqSharingDiff-TTI-Lengths***  Indicates whether the UE supports UL asynchronous HARQ sharing between different TTI lengths for an UL serving cell. | | Yes |
| ***ul-CoMP***  Indicates whether the UE supports UL Coordinated Multi-Point operation. | | No |
| ***ul-dmrs-Enhancements***  Indicates whether the UE supports UL DMRS enhancements as defined in TS 36.211 [21], clause 6.10.3A. | | Yes |
| ***ul-PDCP-AvgDelay***  Indicates whether the UE supports UL PDCP Packet Average Delay measurement (as specified in TS 38.314 [103]) and reporting in RRC\_CONNECTED. | | - |
| ***ul-PDCP-Delay***  Indicates whether the UE supports UL PDCP Packet Delay per QCI measurement as specified in TS 36.314 [71]. | | - |
| ***ul-powerControlEnhancements***  Indicates whether UE supports UplinkPowerControlDedicated. | | Yes |
| ***uplinkLAA***  Presence of the field indicates that the UE supports uplink LAA operation. | | - |
| ***uss-BlindDecodingAdjustment***  Indicates whether the UEsupports blind decoding adjustment on UE specific search space as defined in TS 36.213 [22]. This field can be included only if uplinkLAA is included. | | - |
| ***uss-BlindDecodingReduction***  Indicates whether the UE supports blind decoding reduction on UE specific search space by not monitoring DCI format 0A/0B/4A/4B as defined in TS 36.213 [22]. This field can be included only if uplinkLAA is included. | | - |
| ***unicastFrequencyHopping***  Indicates whether the UE supports frequency hopping for unicast MPDCCH/PDSCH (configured by *mpdcch-pdsch-HoppingConfig*) and unicast PUSCH (configured by *pusch-HoppingConfig*). | | - |
| ***unicast-fembmsMixedSCell***  Indicates whether the UE supports unicast reception from FeMBMS/Unicast mixed cell. This field is included only if UE supports carrier aggregation. | | No |
| ***utra-GERAN-CGI-Reporting-ENDC***  Indicates whether the UE supports Inter-RAT report CGI procedure towards GERAN/UTRA cell when it is configured with (NG)EN-DC wherein either MN and SN have different DRX cycles, or on-duration configured by MN does not contain on-duration configured by SN if their DRX cycles are same. | | Yes |
| ***utran-ProximityIndication***  Indicates whether the UE supports proximity indication for UTRAN CSG member cells. | | - |
| ***utran-SI-AcquisitionForHO***  Indicates whether the UE supports, upon configuration of si-RequestForHO by the network, acquisition and reporting of relevant information using autonomous gaps by reading the SI from a neighbouring UMTS cell. | | Yes |
| ***v2x-BandParametersNR***  Includes the NR *BandParametersSidelink-r16* IE as specified in TS 38.331 [82]. The field includes the per-band sidelink capability for NR-PC5. | | - |
| ***v2x-BandwidthClassTxSL, v2x-BandwidthClassRxSL***  The bandwidth class for V2X sidelink transmission and reception supported by the UE as defined in TS 36.101 [42], Table 5.6G.1-3.  The UE explicitly includes all the supported bandwidth class combinations for V2X sidelink transmission or reception in the band combination signalling. Support for one bandwidth class does not implicitly indicate support for another bandwidth class. | | - |
| ***v2x-eNB-Scheduled***  Indicates whether the UE supports transmitting PSCCH/PSSCH using dynamic scheduling, SPS in eNB scheduled mode for V2X sidelink communication, reporting SPS assistance information and the UE supports maximum transmit power associated with Power class 3 V2X UE, see TS 36.101 [42] in a band. | | - |
| ***v2x-EnhancedHighReception***  Indicates whether the UE supports reception of 30 PSCCH in a subframe and decoding of 204 RBs per subframe counting both PSCCH and PSSCH in a band for V2X sidelink communication. | | - |
| ***v2x-HighPower***  Indicates whether the UE supports maximum transmit power associated with Power class 2 V2X UE for V2X sidelink transmission in a band, see TS 36.101 [42]. | | - |
| ***v2x-HighReception***  Indicates whether the UE supports reception of 20 PSCCH in a subframe and decoding of 136 RBs per subframe counting both PSCCH and PSSCH in a band for V2X sidelink communication. | | - |
| ***v2x-nonAdjacentPSCCH-PSSCH***  Indicates whether the UE supports transmission and reception in the configuration of non-adjacent PSCCH and PSSCH for V2X sidelink communication. | | - |
| ***v2x-numberTxRxTiming***  Indicates the number of multiple reference TX/RX timings counted over all the configured sidelink carriers for V2X sidelink communication. | | - |
| ***v2x-SensingReportingMode3***  Indicates whether the UE supports sensing measurements and reporting of measurement results in eNB scheduled mode for V2X sidelink communication. | | - |
| ***v2x-SupportedBandCombinationList***  Indicates the supported band combination list on which the UE supports simultaneous transmission and/or reception of V2X sidelink communication. | |  |
| ***v2x-SupportedBandCombinationListEUTRA-NR***  Indicates the supported band combination list on which the UE supports simultaneous transmission and/or reception of NR sidelink communication only, or joint V2X sidelink communication and NR sidelink communication. | | - |
| ***v2x-SupportedTxBandCombListPerBC, v2x-SupportedRxBandCombListPerBC***  Indicates, for a particular band combination of EUTRA, the supported band combination list among *v2x-SupportedBandCombinationList* on which the UE supports simultaneous transmission or reception of EUTRA and V2X sidelink communication respectively. The first bit refers to the first entry of *v2x-SupportedBandCombinationList*, with value 1 indicating V2X sidelink transmission/reception is supported. | | - |
| ***v2x-SupportedTxBandCombListPerBC-v1630, v2x-SupportedRxBandCombListPerBC-v1630***  Indicates, for a particular band combination of EUTRA, the supported band combination list among *v2x-SupportedBandCombinationListEUTRA-NR* on which the UE supports simultaneous transmission or reception of EUTRA and NR sidelink communication respectively, or simultaneous transmission or reception of EUTRA and joint V2X sidelink communication and NR sidelink communication respectively. The first bit refers to the first entry of *v2x-SupportedBandCombinationListEUTRA-NR*, with value 1 indicating V2X sidelink transmission/reception is supported. | | - |
| ***v2x-TxWithShortResvInterval***  Indicates whether the UE supports 20 ms and 50 ms resource reservation periods for UE autonomous resource selection and eNB scheduled resource allocation for V2X sidelink communication. | | - |
| ***virtualCellID-BasicSRS***  Indicates whether the UE supports virtual cell ID for basic SRS symbol(s). | | - |
| ***virtualCellID-AddSRS***  This field indicates whether the UE supports virtual cell ID for additional SRS symbol(s). | | - |
| ***voiceOverPS-HS-UTRA-FDD***  Indicates whether UE supports IMS voice according to GSMA IR.58 profile in UTRA FDD. | | - |
| ***voiceOverPS-HS-UTRA-TDD128***  Indicates whether UE supports IMS voice in UTRA TDD 1.28Mcps. | | - |
| ***widebandPRG-Slot, widebandPRG-Subslot, widebandPRG-Subframe***  Indicates whether the UE supports wideband precoding resource block group size for slot/subslot/subframe operation as specified in TS 36.213 [23]. | | - |
| ***wlan-IW-RAN-Rules***  Indicates whether the UE supports RAN-assisted WLAN interworking based on access network selection and traffic steering rules. | | - |
| ***wlan-IW-ANDSF-Policies***  Indicates whether the UE supports RAN-assisted WLAN interworking based on ANDSF policies. | | - |
| ***wlan-MAC-Address***  Indicates the WLAN MAC address of this UE. | | - |
| ***wlan-PeriodicMeas***  Indicates whether the UE supports periodic reporting of WLAN measurements. | | - |
| ***wlan-ReportAnyWLAN***  Indicates whether the UE supports reporting of WLANs not listed in the *measObjectWLAN*. | | - |
| ***wlan-SupportedDataRate***  Indicates the maximum WLAN data rate supported by the UE over all LWA bearers. Actual value of supported data rate is field value \* 10 Mbps (i.e., value 1 corresponds to 10 Mbps, value 2 corresponds to 20 Mbps and so on). | | - |
| ***zp-CSI-RS-AperiodicInfo***  Indicates whether the UE supports aperiodic ZP-CSI-RS transmission for the indicated transmission mode. | | Yes |

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

NOTE 2: The column FDD/ TDD diff indicates if the UE is allowed to signal, as part of the additional capabilities for an XDD mode i.e. within *UE-EUTRA-CapabilityAddXDD-Mode-xNM*, a different value compared to the value signalled elsewhere within *UE-EUTRA-Capability* (i.e. the common value, supported for both XDD modes). A '-' is used to indicate that it is not possible to signal different values (used for fields for which the field description is provided for other reasons). Annex E specifies for which TDD and FDD serving cells a UE supporting TDD/FDD CA shall support a capability for which it indicates support within the capability signalling.

NOTE 2a: From REL-15 onwards, the UE is not allowed to signal different values for FDD and TDD unless yes is indicated in column FDD/ TDD diff (i.e. no need to introduce field description solely for the purpose of indicate no).

NOTE 3: The *BandCombinationParameters* for the same band combination can be included more than once.

NOTE 4: UE CA and measurement capabilities indicate the combinations of frequencies that can be configured as serving frequencies.

NOTE 5: The grouping of the cells to the first and second cell group, as indicated by *supportedCellGrouping*, is shown in the table below. The leading / leftmost bit of *supportedCellGrouping* corresponds to the Bit String Position 1.

|  |  |  |  |
| --- | --- | --- | --- |
| Nr of Band Entries: | 5 | 4 | 3 |
| Length of Bit-String: | 15 | 7 | 3 |
| Bit String Position | Cell grouping option (0= first cell group, 1= second cell group) | | |
| 1 | 00001 | 0001 | 001 |
| 2 | 00010 | 0010 | 010 |
| 3 | 00011 | 0011 | 011 |
| 4 | 00100 | 0100 |  |
| 5 | 00101 | 0101 |  |
| 6 | 00110 | 0110 |  |
| 7 | 00111 | 0111 |  |
| 8 | 01000 |  |  |
| 9 | 01001 |  |  |
| 10 | 01010 |  |  |
| 11 | 01011 |  |  |
| 12 | 01100 |  |  |
| 13 | 01101 |  |  |
| 14 | 01110 |  |  |
| 15 | 01111 |  |  |

NOTE 6: UE includes the *intraBandContiguousCC-InfoList-r12* also for bandwidth class A because of the presence conditions in *BandCombinationParameters-v1270*. For example, if UE supports CA\_1A\_41D band combination, if UE includes the field *intraBandContiguousCC-InfoList-r12* for band 41, the UE includes *intraBandContiguousCC-InfoList-r12* also for band 1.

NOTE 6a: For multiple *BandParameters* entries with the same *bandEUTRA* and same *ca-BandwidthClassDL* in a supported band combination, the UE capabilities indicated by *BandParameters* are agnostic to the order in which they are indicated in the *bandParameterList*, under the condition that the set of the capabilities indicated for the concerned *bandEUTRA* (e.g. *bandParametersDL* and *bandParametersUL)* are used together, and the concerned *BandParameters* correspond to the *supportedBandwithCombinationSet* for which set of channel bandwidths for carrier(s) is the same among sub-blocks, as defined in TS 36.101 [42], Table 5.6A.1-3, Table 5.6A.1-4, Table 5.6A.1-5.

NOTE 7: For a UE that indicates release X in field *accessStratumRelease* but supports a feature specified in release X+ N (i.e. early UE implementation), the ASN.1 comprehension requirement are specified in Annex F.

NOTE 8: For a UE that does not include *mimo-WeightedLayersCapabilities-r13*, or for the case with no CC configured with FD-MIMO, the FD-MIMO processing capability condition is not applicable (i.e. considered as satisfied). For a UE that includes *mimo-WeightedLayersCapabilities-r13*, the FD-MIMO processing capability condition is satisfied if the equation 4.3.28.13-1 in TS 36.306 [5] is satisfied.

#### – *UE-RadioPagingInfo*

The *UE-RadioPagingInfo* IE contains UE capability information needed for paging.

*UE-RadioPagingInfo* information element

-- ASN1START

UE-RadioPagingInfo-r12 ::= SEQUENCE {

ue-Category-v1250 INTEGER (0) OPTIONAL,

...,

[[ ue-CategoryDL-v1310 ENUMERATED {m1} OPTIONAL,

ce-ModeA-r13 ENUMERATED {true} OPTIONAL,

ce-ModeB-r13 ENUMERATED {true} OPTIONAL

]],

[[ wakeUpSignal-r15 ENUMERATED {true} OPTIONAL,

wakeUpSignal-TDD-r15 ENUMERATED {true} OPTIONAL,

wakeUpSignalMinGap-eDRX-r15 ENUMERATED {ms40, ms240, ms1000, ms2000} OPTIONAL,

wakeUpSignalMinGap-eDRX-TDD-r15 ENUMERATED {ms40, ms240, ms1000, ms2000} OPTIONAL

]],

[[ ue-CategoryDL-v1610 ENUMERATED {m2} OPTIONAL,

groupWakeUpSignal-r16 ENUMERATED {true} OPTIONAL,

groupWakeUpSignalTDD-r16 ENUMERATED {true} OPTIONAL,

groupWakeUpSignalAlternation-r16 ENUMERATED {true} OPTIONAL,

groupWakeUpSignalAlternationTDD-r16 ENUMERATED {true} OPTIONAL

]],

[[

inactiveStatePO-Determination-r17 ENUMERATED {true} OPTIONAL

]]

}

-- ASN1STOP

| *UE-RadioPagingInfo* field descriptions |
| --- |
| ***ce-ModeA, ce-ModeB***  Indicates whether the UE supports operation in CE mode A and/or B, as specified in TS 36.211 [21] and TS 36.213 [23]. |
| ***groupWakeUpSignal, groupWakeUpSignalTDD***  Indicates whether the UE supports GWUS for paging in RRC\_IDLE as specified in TS 36.211 [21], TS 36.213 [23] and TS 36.304 [4]. If this field is included, the minimum gap between GWUS and associated PO for DRX is fixed as 40 ms. |
| ***groupWakeUpSignalAlternation, groupWakeUpSignalAlternationTDD***  Indicates whether the UE supports GWUS with group resource alternation for paging in RRC\_IDLE as specified in TS 36.211 [21], TS 36.213 [23] and TS 36.304 [4]. If this field is included, the minimum gap between GWUS and associated PO for DRX is fixed as 40 ms. |
| ***inactiveStatePO-Determination***  Indicates whether the UE other than BL UE or UE in CE supports to use the same i\_s in RRC\_INACTIVE state as in RRC\_IDLE state. |
| ***ue-Category, ue-CategoryDL***  UE category as defined in TS 36.306 [5]. A category M2 UE shall also include the field *ue-CategoryDL-v1310* in this version of the specification. |
| ***wakeUpSignal, wakeUpSignal-TDD***  Indicates whether the UE supports WUS for paging in RRC\_IDLE as specified in TS 36.213 [22] and TS 36.304 [4]. If this field is included, the minimum gap between WUS and associated PO for DRX is fixed as 40 ms. |
| ***wakeUpSignalMinGap-eDRX, wakeUpSignalMinGap-eDRX-TDD***  Indicates the minimum gap the UE supports between WUS and associated PO for eDRX as specified in TS 36.213 [22] and TS 36.304 [4]. Value ms40 corresponds to 40 ms, ms240 corresponds to 240 ms and so on. If this field is included, the UE shall also indicate support of WUS or GWUS for paging. |

#### – *UE-TimersAndConstants*

The IE *UE-TimersAndConstants* contains timers and constants used by the UE in either RRC\_CONNECTED or RRC\_IDLE.

*UE-TimersAndConstants* information element

-- ASN1START

UE-TimersAndConstants ::= SEQUENCE {

t300 ENUMERATED {

ms100, ms200, ms300, ms400, ms600, ms1000, ms1500,

ms2000},

t301 ENUMERATED {

ms100, ms200, ms300, ms400, ms600, ms1000, ms1500,

ms2000},

t310 ENUMERATED {

ms0, ms50, ms100, ms200, ms500, ms1000, ms2000},

n310 ENUMERATED {

n1, n2, n3, n4, n6, n8, n10, n20},

t311 ENUMERATED {

ms1000, ms3000, ms5000, ms10000, ms15000,

ms20000, ms30000},

n311 ENUMERATED {

n1, n2, n3, n4, n5, n6, n8, n10},

...,

[[ t300-v1310 ENUMERATED {

ms2500, ms3000, ms3500, ms4000, ms5000, ms6000, ms8000,

ms10000} OPTIONAL, -- Need OR

t301-v1310 ENUMERATED {

ms2500, ms3000, ms3500, ms4000, ms5000, ms6000, ms8000,

ms10000} OPTIONAL -- Need OR

]],

[[ t310-v1330 ENUMERATED {ms4000, ms6000}

OPTIONAL -- Need OR

]],

[[ t300-r15 ENUMERATED {ms4000, ms6000, ms8000, ms10000, ms15000,

ms25000, ms40000, ms60000} OPTIONAL -- Cond EDTorPUR

]]

}

-- ASN1STOP

| *UE-TimersAndConstants* field descriptions |
| --- |
| ***n3xy***  Constants are described in clause 7.4. n1 corresponds with 1, n2 corresponds with 2 and so on. |
| ***t3xy***  Timers are described in clause 7.3. Value ms0 corresponds with 0 ms, ms50 corresponds with 50 ms and so on. EUTRAN includes an extended value *t3xy-v1310 and t3xy-v1330* only in the Bandwidth Reduced (BR) version of the SIB. UEs that support Coverage Enhancement (CE) mode B shall use the extended values *t3xy-v1310 and t3xy-v1330*, if present, and ignore the value signaled by *t3xy* (without the suffix).  *t300-r15* is only applicable for EDT for mobile originating calls and for UL data transmission using PUR. UE performing EDT for mobile originating calls or UL data transmission using PUR shall use *t300-r15*, if present. |

| Conditional presence | Explanation |
| --- | --- |
| *EDTorPUR* | The field is optionally present, Need OR, if *edt-Parameters* is present in SIB2 or the UE is configured with *pur-Config*; otherwise the field is not present and the UE shall delete any existing value for this field. |

#### – *VisitedCellInfoList*

The IE *VisitedCellInfoList* includes the mobility history information of maximum of 16 most recently visited cells or time spent outside E-UTRA. The most recently visited cell is stored first in the list. The list includes cells visited in RRC\_IDLE and RRC\_CONNECTED states.

*VisitedCellInfoList* information element

-- ASN1START

VisitedCellInfoList-r12 ::= SEQUENCE (SIZE (1..maxCellHistory-r12)) OF VisitedCellInfo-r12

VisitedCellInfo-r12 ::= SEQUENCE {

visitedCellId-r12 CHOICE {

cellGlobalId-r12 CellGlobalIdEUTRA,

pci-arfcn-r12 SEQUENCE {

physCellId-r12 PhysCellId,

carrierFreq-r12 ARFCN-ValueEUTRA-r9

}

} OPTIONAL,

timeSpent-r12 INTEGER (0..4095),

...

}

-- ASN1STOP

| *VisitedCellInfoList* field descriptions |
| --- |
| ***timeSpent***  This field indicates the duration of stay in the cell or outside E-UTRA approximated to the closest second. If the duration of stay exceeds 4095s, the UE shall set it to 4095s. |

#### – *WLAN-OffloadConfig*

The IE *WLAN-OffloadConfig* includes information for traffic steering between E-UTRAN and WLAN. The fields are applicable to both RAN-assisted WLAN interworking based on access network selection and traffic steering rules and RAN-assisted WLAN interworking based on ANDSF policies unless stated otherwise in the field description.

*WLAN-OffloadConfig* information element

-- ASN1START

WLAN-OffloadConfig-r12 ::= SEQUENCE {

thresholdRSRP-r12 SEQUENCE {

thresholdRSRP-Low-r12 RSRP-Range,

thresholdRSRP-High-r12 RSRP-Range

} OPTIONAL, -- Need OR

thresholdRSRQ-r12 SEQUENCE {

thresholdRSRQ-Low-r12 RSRQ-Range,

thresholdRSRQ-High-r12 RSRQ-Range

} OPTIONAL, -- Need OR

thresholdRSRQ-OnAllSymbolsWithWB-r12 SEQUENCE {

thresholdRSRQ-OnAllSymbolsWithWB-Low-r12 RSRQ-Range,

thresholdRSRQ-OnAllSymbolsWithWB-High-r12 RSRQ-Range

} OPTIONAL, -- Need OP

thresholdRSRQ-OnAllSymbols-r12 SEQUENCE {

thresholdRSRQ-OnAllSymbolsLow-r12 RSRQ-Range,

thresholdRSRQ-OnAllSymbolsHigh-r12 RSRQ-Range

} OPTIONAL, -- Need OP

thresholdRSRQ-WB-r12 SEQUENCE {

thresholdRSRQ-WB-Low-r12 RSRQ-Range,

thresholdRSRQ-WB-High-r12 RSRQ-Range

} OPTIONAL, -- Need OP

thresholdChannelUtilization-r12 SEQUENCE {

thresholdChannelUtilizationLow-r12 INTEGER (0..255),

thresholdChannelUtilizationHigh-r12 INTEGER (0..255)

} OPTIONAL, -- Need OR

thresholdBackhaul-Bandwidth-r12 SEQUENCE {

thresholdBackhaulDL-BandwidthLow-r12 WLAN-backhaulRate-r12,

thresholdBackhaulDL-BandwidthHigh-r12 WLAN-backhaulRate-r12,

thresholdBackhaulUL-BandwidthLow-r12 WLAN-backhaulRate-r12,

thresholdBackhaulUL-BandwidthHigh-r12 WLAN-backhaulRate-r12

} OPTIONAL, -- Need OR

thresholdWLAN-RSSI-r12 SEQUENCE {

thresholdWLAN-RSSI-Low-r12 INTEGER (0..255),

thresholdWLAN-RSSI-High-r12 INTEGER (0..255)

} OPTIONAL, -- Need OR

offloadPreferenceIndicator-r12 BIT STRING (SIZE (16)) OPTIONAL, -- Need OR

t-SteeringWLAN-r12 T-Reselection OPTIONAL, -- Need OR

...

}

WLAN-backhaulRate-r12 ::= ENUMERATED

{r0, r4, r8, r16, r32, r64, r128, r256, r512,

r1024, r2048, r4096, r8192, r16384, r32768, r65536, r131072,

r262144, r524288, r1048576, r2097152, r4194304, r8388608,

r16777216, r33554432, r67108864, r134217728, r268435456,

r536870912, r1073741824, r2147483648, r4294967296}

-- ASN1STOP

| *WLAN-OffloadConfig* field descriptions |
| --- |
| ***offloadPreferenceIndicator***  Indicates the offload preference indicator. Parameter: OPI in TS 24.312 [66]. Only applicable to RAN-assisted WLAN interworking based on ANDSF policies. |
| ***thresholdBackhaulDLBandwidth-High***  Indicates the backhaul available downlink bandwidth threshold used by the UE for traffic steering to WLAN. Parameter: ThreshBackhRateDLWLAN, High in TS 36.304 [4]. Value in kilobits/second. Value rN corresponds to N kbps. |
| ***thresholdBackhaulDLBandwidth-Low***  Indicates the backhaul available downlink bandwidth threshold used by the UE for traffic steering to E-UTRAN. Parameter: ThreshBackhRateDLWLAN, Low in TS 36.304 [4]. Value in kilobits/second. Value rN corresponds to N kbps. |
| ***thresholdBackhaulULBandwidth-High***  Indicates the backhaul available uplink bandwidth threshold used by the UE for traffic steering to WLAN. Parameter: ThreshBackhRateULWLAN, High in TS 36.304 [4]. Value in kilobits/second. Value rN corresponds to N kbps. |
| ***thresholdBackhaulULBandwidth-Low***  Indicates the backhaul available uplink bandwidth threshold used by the UE for traffic steering to E-UTRAN. Parameter: ThreshBackhRateULWLAN, Low in TS 36.304 [4]. Value in kilobits/second. Value rN corresponds to N kbps. |
| ***thresholdChannelUtilization-High***  Indicates the WLAN channel utilization (BSS load) threshold used by the UE for traffic steering to E-UTRAN. Parameter:ThreshChUtilWLAN, High in TS 36.304 [4]. |
| ***thresholdChannelUtilization-Low***  Indicates the WLAN channel utilization (BSS load) threshold used by the UE for traffic steering to WLAN. Parameter: ThreshChUtilWLAN, Low in TS 36.304 [4]. |
| ***thresholdRSRP-High***  Indicates the RSRP threshold (in dBm) used by the UE for traffic steering to E-UTRAN. Parameter: ThreshServingOffloadWLAN, HighP in TS 36.304 [4]. |
| ***thresholdRSRP-Low***  Indicates the RSRP threshold (in dBm) used by the UE for traffic steering to WLAN. Parameter: ThreshServingOffloadWLAN, LowP in TS 36.304 [4]. |
| ***thresholdRSRQ-High,thresholdRSRQ-OnAllSymbolsHigh, thresholdRSRQ-WB-High, thresholdRSRQ-OnAllSymbolsWithWB-High***  Indicates the RSRQ threshold (in dB) used by the UE for traffic steering to E-UTRAN. Parameter: ThreshServingOffloadWLAN, HighQ in TS 36.304 [4]. The UE shall only apply one of threshold values of *thresholdRSRQ-OnAllSymbolsWithWB-High, thresholdRSRQ-OnAllSymbolsHigh, thresholdRSRQ-WB-High* and *thresholdRSRQ-High* as present in *wlan-OffloadConfigCommon* and forward this to upper layer. NOTE 1. |
| ***thresholdRSRQ-Low,thresholdRSRQ-OnAllSymbolsLow, thresholdRSRQ-WB-Low, thresholdRSRQ-OnAllSymbolsWithWB-Low***  Indicates the RSRQ threshold (in dB) used by the UE for traffic steering to WLAN. Parameter:ThreshServingOffloadWLAN, LowQ in TS 36.304 [4].  The UE shall only apply one of threshold values of *thresholdRSRQ-OnAllSymbolsWithWB-Low, thresholdRSRQ-OnAllSymbolsLow, thresholdRSRQ-WB-Low* and *thresholdRSRQ-Low* as present in *wlan-OffloadConfigCommon* and forward this to upper layer. NOTE 1. |
| ***thresholdWLAN-RSSI-High***  Indicates the WLAN RSSI threshold used by the UE for traffic steering to WLAN. Parameter: ThreshWLANRSSI, High in TS 36.304 [4]. Value 0 corresponds to -128dBm, 1 corresponds to -127dBm and so on. |
| ***thresholdWLAN-RSSI-Low***  Indicates the WLAN RSSI threshold used by the UE for traffic steering to E-UTRAN. Parameter: ThreshWLANRSSI, Low in TS 36.304 [4]. Value 0 corresponds to -128dBm, 1 corresponds to -127dBm and so on. |
| ***t-SteeringWLAN***  Indicates the timer value during which the rules should be fulfilled before starting traffic steering between E-UTRAN and WLAN. Parameter: TsteeringWLANin TS 36.304 [4]. Only applicable to RAN-assisted WLAN interworking based on access network selection and traffic steering rules. |

NOTE 1: Within SIB17, E-UTRAN includes the fields corresponding to same RSRQ types as included in SIB1. E.g. if E-UTRAN includes *q-QualMinRSRQ-OnAllSymbols* in SIB1 it also includes *thresholdRSRQ-OnAllSymbols* in SIB17. Within the *RRCConnectionReconfiguration* message E-UTRAN only includes *thresholdRSRQ*, setting the value according to the RSRQ type used for E-UTRAN. The UE shall apply the RSRQ fields (RSRQ threshold, high and low) corresponding to one RSRQ type i.e. the same as it applies for E-UTRAN.

### 6.3.7 MBMS information elements

#### – *MBMS-NotificationConfig*

The IE *MBMS-NotificationConfig* specifies the MBMS notification related configuration parameters, that are applicable for all MBSFN areas.

*MBMS-NotificationConfig* information element

-- ASN1START

MBMS-NotificationConfig-r9 ::= SEQUENCE {

notificationRepetitionCoeff-r9 ENUMERATED {n2, n4},

notificationOffset-r9 INTEGER (0..10),

notificationSF-Index-r9 INTEGER (1..6)

}

MBMS-NotificationConfig-v1430 ::= SEQUENCE {

notificationSF-Index-v1430 INTEGER (7..10)

}

-- ASN1STOP

| *MBMS-NotificationConfig* field descriptions |
| --- |
| ***notificationOffset***  Indicates, together with the *notificationRepetitionCoeff*, the radio frames in which the MCCH information change notification is scheduled i.e. the MCCH information change notification is scheduled in radio frames for which: SFN mod notification repetition period = *notificationOffset*. |
| ***notificationRepetitionCoeff***  Actual change notification repetition period common for all MCCHs that are configured= shortest modification period/ *notificationRepetitionCoeff*. The 'shortest modificaton period' corresponds with the lowest value of *mcch-ModificationPeriod* of all MCCHs that are configured. Value n2 corresponds to coefficient 2, and so on. |
| ***notificationSF-Index***  Indicates the subframe used to transmit MCCH change notifications on PDCCH. FDD: Value 1, 2, 3, 4, 5 and 6 correspond with subframe #1, #2, #3 #6, #7, and #8 respectively. Value 7, 8, 9 and 10 correspond with subframe #0, #4, #5 and #9 respectively. If *notificationSF-Index-v1430* is included, UE ignores *notificationSF-Index-r9*. TDD: Value 1, 2, 3, 4, and 5 correspond with subframe #3, #4, #7, #8, and #9 respectively. |

#### – *MBMS-ServiceList*

The IE *MBMS-ServiceList* provides the list of MBMS services which the UE is receiving or interested to receive.

*MBMS-ServiceList* information element

-- ASN1START

MBMS-ServiceList-r13 ::= SEQUENCE (SIZE (0..maxMBMS-ServiceListPerUE-r13)) OF MBMS-ServiceInfo-r13

MBMS-ServiceInfo-r13 ::= SEQUENCE {

tmgi-r13 TMGI-r9

}

-- ASN1STOP

#### – *MBSFN-AreaId*

The IE *MBSFN-AreaId* identifies an MBSFN area by means of a locally unique value at lower layers i.e. it concerns parameter *N*IDMBSFN in TS 36.211 [21], clause 6.10.2.1.

*MBSFN-AreaId* information element

-- ASN1START

MBSFN-AreaId-r12 ::= INTEGER (0..255)

-- ASN1STOP

#### – *MBSFN-AreaInfoList*

The IE *MBSFN-AreaInfoList* contains the information required to acquire the MBMS control information associated with one or more MBSFN areas.

*MBSFN-AreaInfoList* information element

-- ASN1START

MBSFN-AreaInfoList-r9 ::= SEQUENCE (SIZE(1..maxMBSFN-Area)) OF MBSFN-AreaInfo-r9

MBSFN-AreaInfo-r9 ::= SEQUENCE {

mbsfn-AreaId-r9 MBSFN-AreaId-r12,

non-MBSFNregionLength ENUMERATED {s1, s2},

notificationIndicator-r9 INTEGER (0..7),

mcch-Config-r9 SEQUENCE {

mcch-RepetitionPeriod-r9 ENUMERATED {rf32, rf64, rf128, rf256},

mcch-Offset-r9 INTEGER (0..10),

mcch-ModificationPeriod-r9 ENUMERATED {rf512, rf1024},

sf-AllocInfo-r9 BIT STRING (SIZE(6)),

signallingMCS-r9 ENUMERATED {n2, n7, n13, n19}

},

...,

[[ mcch-Config-r14 SEQUENCE {

mcch-RepetitionPeriod-v1430 ENUMERATED {rf1, rf2, rf4, rf8,

rf16 } OPTIONAL, -- Need OR

mcch-ModificationPeriod-v1430 ENUMERATED {rf1, rf2, rf4, rf8, rf16, rf32, rf64, rf128,

rf256, spare7} OPTIONAL -- Need OR

} OPTIONAL, -- Need OR

subcarrierSpacingMBMS-r14 ENUMERATED {kHz7dot5, kHz1dot25} OPTIONAL -- Need OR

]]

}

MBSFN-AreaInfoList-r16 ::= SEQUENCE (SIZE(1..maxMBSFN-Area)) OF MBSFN-AreaInfo-r16

MBSFN-AreaInfo-r16 ::= SEQUENCE {

mbsfn-AreaId-r16 MBSFN-AreaId-r12,

notificationIndicator-r16 INTEGER (0..7),

mcch-Config-r16 SEQUENCE {

mcch-RepetitionPeriod-r16 ENUMERATED {rf1, rf2, rf4, rf8, rf16, rf32, rf64,

rf128, rf256, spare7, spare6, spare5,

spare4, spare3, spare2, spare1},

mcch-ModificationPeriod-r16 ENUMERATED {rf1, rf2, rf4, rf8, rf16, rf32, rf64, rf128,

rf256, rf512, rf1024, spare5, spare4,

spare3,spare2, spare1},

mcch-Offset-r16 INTEGER (0..10),

sf-AllocInfo-r16 BIT STRING (SIZE(10)),

signallingMCS-r16 ENUMERATED {n2, n7, n13, n19}

},

subcarrierSpacingMBMS-r16 ENUMERATED {kHz7dot5, kHz2dot5, kHz1dot25, kHz0dot37,

kHz15-r17, spare3, spare2, spare1},

timeSeparation-r16 ENUMERATED {sl2, sl4} OPTIONAL, -- Need OR

...

}

MBSFN-AreaInfoList-r17 ::= SEQUENCE (SIZE(1..maxMBSFN-Area)) OF MBSFN-AreaInfo-r17

MBSFN-AreaInfo-r17 ::= SEQUENCE {

mbsfn-AreaInfo-r17 MBSFN-AreaInfo-r16,

pmch-Bandwidth-r17 ENUMERATED {n40, n35, n30, spare1},

...

}

-- ASN1STOP

| *MBSFN-AreaInfoList* field descriptions |
| --- |
| ***mcch-ModificationPeriod***  Defines periodically appearing boundaries, i.e. radio frames for which SFN mod *mcch-ModificationPeriod* = 0. The contents of different transmissions of MCCH information can only be different if there is at least one such boundary in-between them. In case *mcch-ModificationPeriod-v1430* is configured, the UE shall ignore the *mcch-ModificationPeriod-r9*. |
| ***mcch-Offset***  Indicates, together with the *mcch-RepetitionPeriod*, the radio frames in which MCCH is scheduled i.e. MCCH is scheduled in radio frames for which: SFN mod *mcch-RepetitionPeriod* = *mcch-Offset*. |
| ***mcch-RepetitionPeriod***  Defines the interval between transmissions of MCCH information, in radio frames, Value rf32 corresponds to 32 radio frames, rf64 corresponds to 64 radio frames and so on. In case *mcch-RepetitionPeriod-v1430* is configured, the UE shall ignore the *mcch-RepetitionPeriod-r9*. |
| ***non-MBSFNregionLength***  Indicates how many symbols from the beginning of the subframe constitute the non-MBSFN region. This value applies in all subframes of the MBSFN area used for PMCH transmissions as indicated in the MSI. The values s1 and s2 correspond with 1 and 2 symbols, respectively: see TS 36.211 [21], Table 6.7-1. |
| ***notificationIndicator***  Indicates which PDCCH bit is used to notify the UE about change of the MCCH applicable for this MBSFN area. Value 0 corresponds with the least significant bit as defined in TS 36.212 [22], clause 5.3.3.1 and so on. |
| ***pmch-Bandwidth***  Indicates the PMCH and corresponding MBSFN-RS bandwidth applicable for this MBSFN area (parameter in TS 36.211 [ 21] and TS 36.213 [23]). Value n40 corresponds to 40 PRBs, n35 corresponds to 35 PRBs and so on. |
| ***sf-AllocInfo-r9***  Indicates the subframes of the radio frames indicated by the *mcch-RepetitionPeriod* and the *mcch-Offset*, that may carry MCCH. Value "1" indicates that the corresponding subframe is allocated. If the bitmap is set to all zeros, the corresponding MBSFN area is considered as not configured.  The following mapping applies:  FDD: The first/ leftmost bit defines the allocation for subframe #1 of the radio frame indicated by *mcch-RepetitionPeriod* and *mcch-Offset*, the second bit for #2, the third bit for #3, the fourth bit for #6, the fifth bit for #7 and the sixth bit for #8.  TDD: The first/leftmost bit defines the allocation for subframe #3 of the radio frame indicated by *mcch-RepetitionPeriod* and *mcch-Offset*, the second bit for #4, third bit for #7, fourth bit for #8, fifth bit for #9. Uplink subframes are not allocated. The last bit is not used. |
| ***sf-AllocInfo-r16***  Indicates the subframes of the radio frames indicated by the *mcch-RepetitionPeriod* and the *mcch-Offset*, that may carry MCCH. Value "1" indicates that the corresponding subframe is allocated. The first/ leftmost bit defines the allocation for subframe #0 of the radio frame indicated by *mcch-RepetitionPeriod* and *mcch-Offset*, the second bit for #1 and so on. When *subcarrierSpacingMBMS* indicates 0.37 kHz subcarrier spacing, a valid MBMS slot can carry MCCH if any subframe corresponding to the slot is configured to carry MCCH. |
| ***signallingMCS***  Indicates the MCS applicable for the subframes indicated by the field *sf-AllocInfo* and for each (P)MCH that is configured for this MBSFN area, for the first subframe allocated to the (P)MCH within each MCH scheduling period (which may contain the MCH scheduling information provided by MAC). Value n2 corresponds with the value 2 for parameter in TS 36.213 [23], Table 7.1.7.1-1, and so on. |
| ***subcarrierSpacingMBMS***  The value indicates subcarrier spacing for MBSFN subframes, kHz7dot5 refers to 7.5 kHz subcarrier spacing, kHz2dot5 refers to 2.5 kHz subcarrier spacing and so on as defined in TS 36.211 [21], clause 6.12. These subframes do not have non-MBSFN region. If *subcarrierSpacingMBMS-r14* is present, then *non-MBSFNregionLength* shall be ignored. EUTRAN configures parameter *subcarrierSpacingMBMS* only when the MBSFN subframes have subcarrier spacing other than 15 kHz or when included in *mbsfn-AreaInfo-r17*. Value kHz15-r17 is applicable only when the field is included in *mbsfn-AreaInfo-r17*. If *subcarrierSpacingMBMS* indicates 0.37 kHz subcarrier spacing, the slot as defined in TS 36.211 [21], clause 4.1 is valid only when all the corresponding subframes are configured as MBSFN subframes in this slot. |
| ***timeSeparation***  Indicates the staggering length for MBSFN-RS associated with PMCH as defined in TS 36.211 [21], clause 6.10.2.2.4. Value sl2 refers to staggering length of 2 slots (MBSFN reference signal pattern type 2) and sl4 refers to staggering length of 4 slots (MBSFN reference signal pattern type 1). E-UTRAN always configures this field when *subcarrierSpacingMBMS* indicates 0.37 kHz subcarrier spacing. Othewise the field is not configured. |

#### – *MBSFN-SubframeConfig*

The IE *MBSFN-SubframeConfig* defines subframes that are reserved for MBSFN in downlink.

*MBSFN-SubframeConfig* information element

-- ASN1START

MBSFN-SubframeConfig ::= SEQUENCE {

radioframeAllocationPeriod ENUMERATED {n1, n2, n4, n8, n16, n32},

radioframeAllocationOffset INTEGER (0..7),

subframeAllocation CHOICE {

oneFrame BIT STRING (SIZE(6)),

fourFrames BIT STRING (SIZE(24))

}

}

MBSFN-SubframeConfig-v1430 ::= SEQUENCE {

subframeAllocation-v1430 CHOICE {

oneFrame-v1430 BIT STRING (SIZE(2)),

fourFrames-v1430 BIT STRING (SIZE(8))

}

}

MBSFN-SubframeConfig-v1610 ::= SEQUENCE {

subframeAllocation-v1610 CHOICE {

oneFrame-v1610 BIT STRING (SIZE(2)),

fourFrames-v1610 BIT STRING (SIZE(8))

}

}

-- ASN1STOP

| *MBSFN-SubframeConfig* field descriptions |
| --- |
| ***fourFrames***  A bit-map indicating MBSFN subframe allocation in four consecutive radio frames, "1" denotes that the corresponding subframe is allocated for MBSFN. The bitmap is interpreted as follows:  FDD: Starting from the first radioframe and from the first/leftmost bit in the bitmap, the allocation applies to subframes #1, #2, #3, #6, #7, and #8 in the sequence of the four radio-frames.  TDD: Starting from the first radioframe and from the first/leftmost bit in the bitmap, the allocation applies to subframes #3, #4, #7, #8, and #9 in the sequence of the four radio-frames. The last four bits are not used. E-UTRAN allocates uplink subframes only if *eimta-MainConfig* is configured. |
| ***fourFrames-v1430, fourFrames-v1610***  A bit-map indicating MBSFN subframe allocation in four consecutive radio frames, "1" denotes that the corresponding subframe is allocated for MBSFN. The bitmap is interpreted as follows:  FDD: Starting from the first radioframe and from the first/leftmost bit in the bitmap, the allocation indicated by *fourFrames-v1430* applies to subframes #4 and #9 in the sequence of the four radio-frames. Starting from the first radioframe and from the first/leftmost bit in the bitmap, the allocation indicated by *fourFrames-v1610*, if present, applies to subframes #0 and #5 in the sequence of the four radio-frames. |
| ***oneFrame***  "1" denotes that the corresponding subframe is allocated for MBSFN. The following mapping applies:  FDD: The first/leftmost bit defines the MBSFN allocation for subframe #1, the second bit for #2, third bit for #3, fourth bit for #6, fifth bit for #7, sixth bit for #8.  TDD: The first/leftmost bit defines the allocation for subframe #3, the second bit for #4, third bit for #7, fourth bit for #8, fifth bit for #9. E-UTRAN allocates uplink subframes only if *eimta-MainConfig* is configured. The last bit is not used. |
| ***oneFrame-v1430, oneFrame-v1610***  "1" denotes that the corresponding subframe is allocated for MBSFN. The following mapping applies:  FDD: The first/leftmost bit indicated by *oneFrame-v1430* defines the MBSFN allocation for subframe #4 and the second bit for #9. The first/leftmost bit indicated by *oneFrame-v1610*, if present,defines the MBSFN allocation for subframe #0 and the second bit for #5. |
| ***radioFrameAllocationPeriod, radioFrameAllocationOffset***  Radio-frames that contain MBSFN subframes occur when equation *SFN* mod *radioFrameAllocationPeriod* = *radioFrameAllocationOffset*is satisfied. Value n1 for *radioframeAllocationPeriod* denotes value 1, n2 denotes value 2, and so on. When *fourFrames* is used for *subframeAllocation*, the equation defines the first radio frame referred to in the description below. Values *n1* and *n2* are not applicable when *fourFrames* is used. |
| ***subframeAllocation***  Defines the subframes that are allocated for MBSFN within the radio frame allocation period defined by the *radioFrameAllocationPeriod* and the *radioFrameAllocationOffset.* |

#### – *PMCH-InfoList*

The IE *PMCH-InfoList* specifies configuration of all PMCHs of an MBSFN area, while IE *PMCH-InfoListExt* includes additional PMCHs, i.e. extends the PMCH list using the general principles specified in 5.1.2. The information provided for an individual PMCH includes the configuration parameters of the sessions that are carried by the concerned PMCH. For all PMCH that E-UTRAN includes in *PMCH-InfoList*, the list of ongoing sessions has at least one entry.

*PMCH-InfoList* information element

-- ASN1START

PMCH-InfoList-r9 ::= SEQUENCE (SIZE (0..maxPMCH-PerMBSFN)) OF PMCH-Info-r9

PMCH-InfoListExt-r12 ::= SEQUENCE (SIZE (0..maxPMCH-PerMBSFN)) OF PMCH-InfoExt-r12

PMCH-Info-r9 ::= SEQUENCE {

pmch-Config-r9 PMCH-Config-r9,

mbms-SessionInfoList-r9 MBMS-SessionInfoList-r9,

...

}

PMCH-InfoExt-r12 ::= SEQUENCE {

pmch-Config-r12 PMCH-Config-r12,

mbms-SessionInfoList-r12 MBMS-SessionInfoList-r9,

...

}

MBMS-SessionInfoList-r9 ::= SEQUENCE (SIZE (0..maxSessionPerPMCH)) OF MBMS-SessionInfo-r9

MBMS-SessionInfo-r9 ::= SEQUENCE {

tmgi-r9 TMGI-r9,

sessionId-r9 OCTET STRING (SIZE (1)) OPTIONAL, -- Need OR

logicalChannelIdentity-r9 INTEGER (0..maxSessionPerPMCH-1),

...

}

PMCH-Config-r9 ::= SEQUENCE {

sf-AllocEnd-r9 INTEGER (0..1535),

dataMCS-r9 INTEGER (0..28),

mch-SchedulingPeriod-r9 ENUMERATED {

rf8, rf16, rf32, rf64, rf128, rf256, rf512, rf1024},

...

}

PMCH-Config-r12 ::= SEQUENCE {

sf-AllocEnd-r12 INTEGER (0..1535),

dataMCS-r12 CHOICE {

normal-r12 INTEGER (0..28),

higerOrder-r12 INTEGER (0..27)

},

mch-SchedulingPeriod-r12 ENUMERATED {

rf4, rf8, rf16, rf32, rf64, rf128, rf256, rf512, rf1024},

...,

[[ mch-SchedulingPeriod-v1430 ENUMERATED {rf1, rf2} OPTIONAL -- Need OR

]]

}

TMGI-r9 ::= SEQUENCE {

plmn-Id-r9 CHOICE {

plmn-Index-r9 INTEGER (1..maxPLMN-r11),

explicitValue-r9 PLMN-Identity

},

serviceId-r9 OCTET STRING (SIZE (3))

}

-- ASN1STOP

| *PMCH-InfoList* field descriptions |
| --- |
| ***dataMCS***  Indicates the value for parameter in TS 36.213 [23], which defines the MCS applicable for the subframes of this (P)MCH as indicated by the field *commonSF-Alloc*. Value *normal* corresponds to Table 7.1.7.1-1 and value *higherOrder* corresponds to Table 7.1.7.1-1A. The MCS does however neither apply to the subframes that may carry MCCH i.e. the subframes indicated by the field *sf-AllocInfo* within *SystemInformationBlockType13* nor for the first subframe allocated to this (P)MCH within each MCH scheduling period (which may contain the MCH scheduling information provided by MAC). |
| ***mch-SchedulingPeriod***  Indicates the MCH scheduling period i.e. the periodicity used for providing MCH scheduling information at lower layers (MAC) applicable for an MCH. Value rf8 corresponds to 8 radio frames, rf16 corresponds to 16 radio frames and so on. The *mch-SchedulingPeriod* starts in the radio frames for which: SFN mod *mch-SchedulingPeriod* = 0. E-UTRAN configures *mch-SchedulingPeriod* of the (P)MCH listed first in *PMCH-InfoList* to be smaller than or equal to *mcch-RepetitionPeriod.* In case *mch-SchedulingPeriod-v1430* is configured, the UE shall ignore *mch-SchedulingPeriod-r12*. |
| ***plmn-Index***  Index of the entry across the *plmn-IdentityList* fields within *SystemInformationBlockType1*. |
| ***sessionId***  Indicates the optional MBMS Session Identity, which together with TMGI identifies a transmission or a possible retransmission of a specific MBMS session: see TS 29.061 [51], clauses 20.5, 17.7.11, and 17.7.15. The field is included whenever upper layers have assigned a session identity i.e. one is available for the MBMS session in E-UTRAN. |
| ***serviceId***  Uniquely identifies the identity of an MBMS service within a PLMN. The field contains octet 3- 5 of the IE Temporary Mobile Group Identity (TMGI) as defined in TS 24.008 [49]. The first octet contains the third octet of the TMGI, the second octet contains the fourth octet of the TMGI and so on. |
| ***sf-AllocEnd***  Indicates the last subframe allocated to this (P)MCH within a period identified by field *commonSF-AllocPeriod*. The subframes allocated to (P)MCH corresponding with the nth entry in *pmch-InfoList* are the subsequent subframes starting from either the next subframe after the subframe identified by *sf-AllocEnd* of the (n-1)th listed (P)MCH or, for n=1, the first subframe defined by field *commonSF-Alloc*, through the subframe identified by *sf-AllocEnd* of the nth listed (P)MCH. Value 0 corresponds with the first subframe defined by field *commonSF-Alloc*. |

### 6.3.7a SC-PTM information elements

#### – *SC-MTCH-InfoList*

The IE *SC-MTCH-InfoList* provides the list of ongoing MBMS sessions transmitted via SC-MRB and for each MBMS session, the associated G-RNTI and scheduling information.

*SC-MTCH-InfoList* information element

-- ASN1START

SC-MTCH-InfoList-r13 ::= SEQUENCE (SIZE (0..maxSC-MTCH-r13)) OF SC-MTCH-Info-r13

SC-MTCH-Info-r13 ::= SEQUENCE {

mbmsSessionInfo-r13 MBMSSessionInfo-r13,

g-RNTI-r13 BIT STRING(SIZE(16)),

sc-mtch-schedulingInfo-r13 SC-MTCH-SchedulingInfo-r13 OPTIONAL, -- Need OP

sc-mtch-neighbourCell-r13 BIT STRING (SIZE(maxNeighCell-SCPTM-r13)) OPTIONAL, -- Need OP

...,

[[ p-a-r13 ENUMERATED {

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

dB0, dB1, dB2, dB3} OPTIONAL -- Need ON

]]

}

MBMSSessionInfo-r13 ::= SEQUENCE {

tmgi-r13 TMGI-r9,

sessionId-r13 OCTET STRING (SIZE (1)) OPTIONAL -- Need OR

}

SC-MTCH-SchedulingInfo-r13::= SEQUENCE {

onDurationTimerSCPTM-r13 ENUMERATED {

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

psf8, psf10, psf20, psf30, psf40,

psf50, psf60, psf80, psf100,

psf200},

drx-InactivityTimerSCPTM-r13 ENUMERATED {

psf0, psf1, psf2, psf4, psf8,

psf10, psf20, psf40,

psf80, psf160, ps320,

psf640, psf960,

psf1280, psf1920, psf2560},

schedulingPeriodStartOffsetSCPTM-r13 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),

sf2048 INTEGER(0..2048),

sf4096 INTEGER(0..4096),

sf8192 INTEGER(0..8192)

},

...

}

-- ASN1STOP

| ***SC-MTCH-InfoList* field descriptions** |
| --- |
| ***drx-InactivityTimerSCPTM***  Timer for SC-MTCH 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, psf1 corresponds to 1 PDCCH sub-frame, psf2 corresponds to 2 PDCCH sub-frames and so on. |
| ***g-RNTI***  G-RNTI used to scramble the scheduling and transmission of a SC-MTCH. |
| ***mbmsSessionInfo***  Indicates the ongoing MBMS session in a SC-MTCH. |
| ***onDurationTimerSCPTM***  Timer for SC-MTCH reception 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. |
| ***p-a***  Parameter: , for the SC-MTCH per G-RNTI, see TS 36.213 [23], clause 5.2. Value dB-6 corresponds to -6 dB, dB-4dot77 corresponds to -4.77 dB etc. |
| ***schedulingPeriodStartOffsetSCPTM***  *SCPTM-SchedulingCycle* and *SCPTM-SchedulingOffset* in TS 36.321 [6]. The value of *SCPTM-SchedulingCycle* is in number of sub-frames. Value sf10 corresponds to 10 sub-frames, sf20 corresponds to 20 sub-frames and so on. The value of *SCPTM-SchedulingOffset* is in number of sub-frames. The E-UTRAN does not configure a maximum value 2048 for sf2048, 4096 for sf4096 or 8192 for sf8192. |
| ***sc-mtch-neighbourCell***  Indicates neighbour cells which also provide this service on SC-MTCH. The first bit is set to 1 if the service is provided on SC-MTCH in the first cell in *scptmNeighbourCellList*, otherwise it is set to 0. The second bit is set to 1 if the service is provided on SC-MTCH in the second cell in *scptmNeighbourCellList*, and so on. If this field is absent, the UE shall assume that this service is not available on SC-MTCH in any neighbour cell. |
| ***sc-mtch-schedulingInfo***  DRX information for the SC-MTCH. If this field is absent, the SC-MTCH may be scheduled in any subframe. |

#### – *SC-MTCH-InfoList-BR*

The IE *SC-MTCH-InfoList-BR* provides the list of ongoing MBMS sessions transmitted via SC-MRB and for each MBMS session, the associated G-RNTI and scheduling information.

*SC-MTCH-InfoList-BR* information element

-- ASN1START

SC-MTCH-InfoList-BR-r14 ::= SEQUENCE (SIZE (0..maxSC-MTCH-BR-r14)) OF SC-MTCH-Info-BR-r14

SC-MTCH-Info-BR-r14 ::= SEQUENCE {

sc-mtch-CarrierFreq-r14 ARFCN-ValueEUTRA-r9,

mbmsSessionInfo-r14 MBMSSessionInfo-r13,

g-RNTI-r14 BIT STRING(SIZE(16)),

sc-mtch-schedulingInfo-r14 SC-MTCH-SchedulingInfo-BR-r14 OPTIONAL, -- Need OP

sc-mtch-neighbourCell-r14 BIT STRING (SIZE(maxNeighCell-SCPTM-r13)) OPTIONAL, -- Need OP

mpdcch-Narrowband-SC-MTCH-r14 INTEGER (1.. maxAvailNarrowBands-r13),

mpdcch-NumRepetition-SC-MTCH-r14 ENUMERATED {r1, r2, r4, r8, r16,

r32, r64, r128, r256},

mpdcch-StartSF-SC-MTCH-r14 CHOICE {

fdd-r14 ENUMERATED {v1, v1dot5, v2, v2dot5, v4,

v5, v8, v10},

tdd-r14 ENUMERATED {v1, v2, v4, v5, v8, v10,

v20}

},

mpdcch-PDSCH-HoppingConfig-SC-MTCH-r14 ENUMERATED {on, off},

mpdcch-PDSCH-CEmodeConfig-SC-MTCH-r14 ENUMERATED {ce-ModeA, ce-ModeB},

mpdcch-PDSCH-MaxBandwidth-SC-MTCH-r14 ENUMERATED {bw1dot4, bw5},

mpdcch-Offset-SC-MTCH-r14 ENUMERATED {zero, oneEighth, oneQuarter,

threeEighth, oneHalf, fiveEighth,

threeQuarter, sevenEighth},

p-a-r14 ENUMERATED { dB-6, dB-4dot77, dB-3,

dB-1dot77, dB0, dB1, dB2,

dB3} OPTIONAL,-- Need OR

...

}

SC-MTCH-SchedulingInfo-BR-r14::= SEQUENCE {

onDurationTimerSCPTM-r14 ENUMERATED {

psf300, psf400, psf500, psf600,

psf800, psf1000, psf1200, psf1600},

drx-InactivityTimerSCPTM-r14 ENUMERATED {

psf0, psf1, psf2, psf4, psf8, psf16,

psf32, psf64, psf128, psf256, ps512,

psf1024, psf2048, psf4096, psf8192, psf16384},

schedulingPeriodStartOffsetSCPTM-r14 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),

sf2048 INTEGER(0..2047),

sf4096 INTEGER(0..4095),

sf8192 INTEGER(0..8191)

},

...

}

-- ASN1STOP

| *SC-MTCH-InfoList-BR* field descriptions |
| --- |
| ***drx-InactivityTimerSCPTM***  Timer for SC-MTCH in TS 36.321 [6]. Value in number of MPDCCH sub-frames. Value psf0 corresponds to 0 MPDCCH sub-frame and behaviour as specified in 7.3.2 applies, psf1 corresponds to 1 MPDCCH sub-frame, psf2 corresponds to 2 MPDCCH sub-frames and so on. |
| ***g-RNTI***  G-RNTI used to scramble the scheduling and transmission of a SC-MTCH |
| ***mbmsSessionInfo***  Indicates the ongoing MBMS session in a SC-MTCH. |
| ***mpdcch-Narrowband-SC-MTCH***  Narrowband for MPDCCH for SC-MTCH, see TS 36.213 [23]. |
| ***mpdcch-NumRepetitions-SC-MTCH***  The maximum number of MPDCCH repetitions the UE needs to monitor for SC-MTCH, see TS 36.213 [23]. |
| ***mpdcch-Offset-SC-MTCH***  Fractional period offset of starting subframes for MPDCCH search space for SC-MTCH, see TS 36.213 [23]. |
| ***mpdcch-PDSCH-CEmodeConfig-SC-MTCH***  Coverage enhancement mode configuration for MPDCCH/PDSCH for SC-MTCH, see TS 36.213 [23]. |
| ***mpdcch-PDSCH-HoppingConfig-SC-MTCH***  Frequency hopping configuration for MPDCCH/PDSCH for SC-MTCH, see TS 36.213 [23]. |
| ***mpdcch-PDSCH-MaxBandwidth-SC-MTCH***  Maximum PDSCH channel bandwidth for SC-MTCH, see TS 36.213 [23]. Value *bw1dot4* corresponds to 1.4 MHz channel bandwidth and value *bw5* corresponds to 5 MHz channel bandwidth. Corresponding maximum TBS are specified in TS 36.213 [23], clause 7.1.7.2. |
| ***mpdcch-StartSF-SC-MTCH***  Starting subframes configuration of the MPDCCH search space for SC-MTCH, see TS 36.213 [23]. |
| ***onDurationTimerSCPTM***  Timer for SC-MTCH reception in TS 36.321 [6]. Value in number of MPDCCH sub-frames. Value psf300 corresponds to 300 MPDCCH sub-frames, psf400 corresponds to 400 MPDCCH sub-frames and so on. |
| ***schedulingPeriodStartOffsetSCPTM***  *SCPTM-SchedulingCycle* and *SCPTM-SchedulingOffset* in TS 36.321 [6]. The value of *SCPTM-SchedulingCycle* is in number of sub-frames. Value sf10 corresponds to 10 sub-frames, sf20 corresponds to 20 sub-frames and so on. The value of *SCPTM-SchedulingOffset* is in number of sub-frames. |
| ***sc-mtch-CarrierFreq***  Downlink carrier used for multicast SC-MTCH transmissions. |
| ***sc-mtch-neighbourCell***  Indicates neighbour cells which also provide this service on SC-MTCH. The first bit is set to 1 if the service is provided on SC-MTCH in the first cell in *scptmNeighbourCellList*, otherwise it is set to 0. The second bit is set to 1 if the service is provided on SC-MTCH in the second cell in *scptmNeighbourCellList*, and so on. If this field is absent, the UE shall assume that this service is not available on SC-MTCH in any neighbour cell. |
| ***sc-mtch-schedulingInfo***  DRX information for the SC-MTCH. If this field is absent, DRX is not used for SC-MTCH reception. |
| ***p-a***  Parameter:  for the SC-MTCH per G-RNTI, see TS 36.213 [23], clause 5.2. Value dB-6 corresponds to -6 dB, dB-4dot77 corresponds to -4.77 dB etc. |

#### – *SCPTM-NeighbourCellList*

The IE *SCPTM-NeighbourCellList* indicates a list of neighbour cells where ongoing MBMS sessions provided via SC-MRB in the current cells are also provided.

-- ASN1START

SCPTM-NeighbourCellList-r13 ::= SEQUENCE (SIZE (1..maxNeighCell-SCPTM-r13)) OF PCI-ARFCN-r13

PCI-ARFCN-r13 ::= SEQUENCE {

physCellId-r13 PhysCellId,

carrierFreq-r13 ARFCN-ValueEUTRA-r9 OPTIONAL

}

-- ASN1STOP

| *SCPTM-NeighbourCellList* field description |
| --- |
| ***carrierFreq***  Indicates the frequency of the neighbour cell indicated by *physCellId*. Absence of the IE means that the neighbour cell is on the same frequency as the current cell. |

### 6.3.8 Sidelink information elements

#### – *SL-AnchorCarrierFreqList-V2X*

The IE *SL-AnchorCarrierFreqList-V2X* specifies the SL V2X anchor frequencies i.e. frequencies that include inter-carrier resource configuration for V2X sidelink communication.

*SL-AnchorCarrierFreqList-V2X* information element

-- ASN1START

SL-AnchorCarrierFreqList-V2X-r14 ::= SEQUENCE (SIZE (1..maxFreqV2X-r14)) OF ARFCN-ValueEUTRA-r9

-- ASN1STOP

#### – *SL-CBR-CommonTxConfigList*

The IE *SL-CBR-CommonTxConfigList* indicates the list of PSSCH transmission parameters (such as MCS, sub-channel number, retransmission number, CR limit) in *sl-CBR-PSSCH-TxConfigList*, and the list of CBR ranges in *cbr-RangeCommonConfigList,* to configure congestion control to the UE for V2X sidelink communication.

*SL-CBR-CommonTxConfigList* information element

-- ASN1START

SL-CBR-CommonTxConfigList-r14 ::= SEQUENCE {

cbr-RangeCommonConfigList-r14 SEQUENCE (SIZE (1..maxSL-V2X-CBRConfig-r14)) OF SL-CBR-Levels-Config-r14,

sl-CBR-PSSCH-TxConfigList-r14 SEQUENCE (SIZE (1..maxSL-V2X-TxConfig-r14)) OF SL-CBR-PSSCH-TxConfig-r14

}

SL-CBR-Levels-Config-r14 ::= SEQUENCE (SIZE (1..maxCBR-Level-r14)) OF SL-CBR-r14

SL-CBR-PSSCH-TxConfig-r14 ::= SEQUENCE {

cr-Limit-r14 INTEGER(0..10000),

tx-Parameters-r14 SL-PSSCH-TxParameters-r14

}

SL-CBR-r14 ::= INTEGER(0..100)

-- ASN1STOP

| *SL-CBR-CommonTxConfigList* field descriptions |
| --- |
| ***cbr-RangeCommonConfigList***  Indicates the list of CBR ranges. Each entry of the listindicates in *SL-CBR-Levels-Config* the upper bound of the CBR range for the respective entry. The upper bounds of the CBR ranges are configured in ascending order for consecutive entries of *cbr-RangeCommonConfigList*. For the first entry of *cbr-RangeCommonConfigList* the lower bound of the CBR range is 0. |
| ***cr-Limit***  Indicates the maximum limit on the occupancy ratio. Value 0 corresponds to 0, value 1 to 0.0001, value 2 to 0.0002, and so on (i.e. in steps of 0.0001) until value 10000, which corresponds to 1. |
| ***sl-CBR-PSSCH-TxConfigList***  Indicates the list of available PSSCH transmission parameters (such as MCS, sub-channel number, retransmission number and CR limit) configurations. |
| ***SL-CBR***  Value 0 corresponds to 0, value 1 to 0.01, value 2 to 0.02, and so on. |
| ***tx-Parameters***  Indicates PSSCH transmission parameters. |

#### – *SL-CBR-PPPP-TxConfigList*

The IE *SL-CBR-PPPP-TxConfigList* indicates the mapping between PSSCH transmission parameter (such as MCS, PRB number, retransmission number, CR limit) sets by using the indexes of the configurations provided in *sl-CBR-PSSCH-TxConfigList*, CBR ranges by an index to the entry of the CBR range configuration in *cbr-RangeCommonConfigList*, and PPPP ranges. It also indicates the default PSSCH transmission parameters to be used when CBR measurement results are not available.

*SL-CBR-PPPP-TxConfigList* information element

-- ASN1START

SL-CBR-PPPP-TxConfigList-r14 ::= SEQUENCE (SIZE (1..8)) OF SL-PPPP-TxConfigIndex-r14

SL-PPPP-TxConfigIndex-r14 ::= SEQUENCE {

priorityThreshold-r14 SL-Priority-r13,

defaultTxConfigIndex-r14 INTEGER(0..maxCBR-Level-1-r14),

cbr-ConfigIndex-r14 INTEGER(0..maxSL-V2X-CBRConfig-1-r14),

tx-ConfigIndexList-r14 SEQUENCE (SIZE (1..maxCBR-Level-r14)) OF Tx-ConfigIndex-r14

}

Tx-ConfigIndex-r14 ::= INTEGER(0..maxSL-V2X-TxConfig-1-r14)

SL-CBR-PPPP-TxConfigList-v1530 ::= SEQUENCE (SIZE (1..8)) OF SL-PPPP-TxConfigIndex-v1530

SL-PPPP-TxConfigIndex-v1530 ::= SEQUENCE {

mcs-PSSCH-RangeList-r15 SEQUENCE (SIZE (1..maxCBR-Level-r14)) OF MCS-PSSCH-Range-r15 OPTIONAL --Need OR

}

MCS-PSSCH-Range-r15 ::= SEQUENCE{

minMCS-PSSCH-r15 INTEGER (0..31),

maxMCS-PSSCH-r15 INTEGER (0..31)

}

SL-CBR-PPPP-TxConfigList-r15 ::= SEQUENCE (SIZE (1..8)) OF SL-PPPP-TxConfigIndex-r15

SL-PPPP-TxConfigIndex-r15 ::= SEQUENCE {

priorityThreshold-r15 SL-Priority-r13,

defaultTxConfigIndex-r15 INTEGER(0..maxCBR-Level-1-r14),

cbr-ConfigIndex-r15 INTEGER(0..maxSL-V2X-CBRConfig-1-r14),

tx-ConfigIndexList-r15 SEQUENCE (SIZE (1..maxCBR-Level-r14)) OF Tx-ConfigIndex-r14,

mcs-PSSCH-RangeList-r15 SEQUENCE (SIZE (1..maxCBR-Level-r14)) OF MCS-PSSCH-Range-r15

}

-- ASN1STOP

| *SL-CBR-PPPP-TxConfigList* field descriptions |
| --- |
| ***cbr-ConfigIndex***  Indicates the CBR ranges to be used by an index to the entry of the CBR range configuration in *cbr-RangeCommonConfigList*. |
| ***defaultTxConfigIndex***  Indicates the PSSCH transmission parameters to be used by the UEs which do not have available CBR measurement results, by means of an index to the corresponding entry in *tx-ConfigIndexList*. Value 0 indicates the first entry in *tx-ConfigIndexList*. The field is ignored if the UE has available CBR measurement results. |
| ***mcs-PSSCH-RangeList***  If included, this field applies to the PPPP(s) indicated by the *priorityThreshold* and each entry in this field sequentially corresponds to each CBR range indicated by *cbr-ConfigIndex*. |
| ***minMCS-PSSCH, maxMCS-PSSCH***  Indicates the minimum and maximum MCS values which correspond to both the MCS table in Table 8.6.1-1 and Table 14.1.1-2 in TS 36.213 [23] used for transmission on PSSCH. |
| ***priorityThreshold***  Indicates the upper bound of PPPP range which is associated with the configurations in *cbr-ConfigIndex* and in *tx-ConfigIndexList*. The upper bounds of the PPPP ranges are configuredin ascending order for consecutive entries of *SL-PPPP-TxConfigIndex* in *SL-CBR-PPPP-TxConfigList*. For the first entry of *SL-PPPP-TxConfigIndex,* the lower bound of the PPPP range is 1. |
| ***SL-CBR-PPPP-TxConfigList-v1530***  If included, E-UTRAN shall include the same number of entries, and listed in the same order, as in *SL-CBR-PPPP-TxConfigList-r14*. |
| ***tx-ConfigIndexList***  Indicates the list of the PSSCH transmission parameters and CR limit by the indexes to the entries of the configurations in *sl-CBR-PSSCH-TxConfigList*. Each index in *tx-ConfigIndexList* sequentially maps to each CBR range indicated by *cbr-ConfigIndex*. |

#### – *SL-CommConfig*

The IE *SL-CommConfig* specifies the dedicated configuration information for sidelink communication. In particular it concerns the transmission resource configuration for sidelink communication on the primary frequency.

*SL-CommConfig* information element

-- ASN1START

SL-CommConfig-r12 ::= SEQUENCE {

commTxResources-r12 CHOICE {

release NULL,

setup CHOICE {

scheduled-r12 SEQUENCE {

sl-RNTI-r12 C-RNTI,

mac-MainConfig-r12 MAC-MainConfigSL-r12,

sc-CommTxConfig-r12 SL-CommResourcePool-r12,

mcs-r12 INTEGER (0..28) OPTIONAL -- Need OP

},

ue-Selected-r12 SEQUENCE {

-- Pool for normal usage

commTxPoolNormalDedicated-r12 SEQUENCE {

poolToReleaseList-r12 SL-TxPoolToReleaseList-r12 OPTIONAL, -- Need ON

poolToAddModList-r12 SL-CommTxPoolToAddModList-r12 OPTIONAL -- Need ON

}

}

}

} OPTIONAL, -- Need ON

...,

[[ commTxResources-v1310 CHOICE {

release NULL,

setup CHOICE {

scheduled-v1310 SEQUENCE {

logicalChGroupInfoList-r13 LogicalChGroupInfoList-r13,

multipleTx-r13 BOOLEAN

},

ue-Selected-v1310 SEQUENCE {

commTxPoolNormalDedicatedExt-r13 SEQUENCE {

poolToReleaseListExt-r13 SL-TxPoolToReleaseListExt-r13 OPTIONAL, -- Need ON

poolToAddModListExt-r13 SL-CommTxPoolToAddModListExt-r13 OPTIONAL -- Need ON

}

}

}

} OPTIONAL, -- Need ON

commTxAllowRelayDedicated-r13 BOOLEAN OPTIONAL -- Need ON

]]

}

LogicalChGroupInfoList-r13 ::= SEQUENCE (SIZE (1..maxLCG-r13)) OF SL-PriorityList-r13

SL-CommTxPoolToAddModList-r12 ::= SEQUENCE (SIZE (1..maxSL-TxPool-r12)) OF SL-CommTxPoolToAddMod-r12

SL-CommTxPoolToAddModListExt-r13 ::= SEQUENCE (SIZE (1..maxSL-TxPool-v1310)) OF SL-CommTxPoolToAddModExt-r13

SL-CommTxPoolToAddMod-r12 ::= SEQUENCE {

poolIdentity-r12 SL-TxPoolIdentity-r12,

pool-r12 SL-CommResourcePool-r12

}

SL-CommTxPoolToAddModExt-r13 ::= SEQUENCE {

poolIdentity-v1310 SL-TxPoolIdentity-v1310,

pool-r13 SL-CommResourcePool-r12

}

MAC-MainConfigSL-r12 ::= SEQUENCE {

periodic-BSR-TimerSL PeriodicBSR-Timer-r12 OPTIONAL, -- Need ON

retx-BSR-TimerSL RetxBSR-Timer-r12

}

-- ASN1STOP

| *SL-CommConfig* field descriptions |
| --- |
| ***commTxAllowRelayDedicated***  Indicates whether the UE is allowed to transmit relay related sidelink communication using the configured dedicated transmission resources i.e. either via scheduled or via UE selected resources. |
| ***commTxPoolNormalDedicated***  Indicates a pool of transmission resources the UE is allowed to use while in RRC\_CONNECTED. |
| ***logicalChGroupInfoList***  Indicates for each logical channel group the list of associated priorities, used as specified in TS 36.321 [6], in order of increasing logical channel group identity. |
| ***mcs***  Indicates the MCS as defined in TS 36.212 [23], clause 14.2.1. If not configured, the selection of MCS is up to UE implementation. |
| ***multipleTx***  Indicates whether the UE should perform multiple transmissions to different destinations in one SC period in accordance with TS 36.321 [6], clause 5.14.1.1. Value TRUE indicates that multiple transmissions should be performed. |
| ***sc-CommTxConfig***  Indicates a pool of resources for SC when E-UTRAN schedules Tx resources (i.e. when indices included in DCI format 5 indicate the actual data resources to be used as specified in TS 36.212 [22], clause 5.3.3.1.9). |
| ***scheduled***  Indicates the configuration for the case E-UTRAN schedules the transmission resources based on sidelink specific BSR from the UE. |
| ***ue-Selected***  Indicates the configuration for the case the UE selects the transmission resources from a pool of resources configured by E-UTRAN. |

#### – *SL-CommResourcePool*

The IE *SL-CommResourcePool* and *SL-CommResourcePoolV2X* specifies the configuration information for an individual pool of resources for sidelink communication and V2X sidelink communication respectively. The IE covers the configuration of both the sidelink control information and the data.

*SL-CommResourcePool* information element

-- ASN1START

SL-CommTxPoolList-r12 ::= SEQUENCE (SIZE (1..maxSL-TxPool-r12)) OF SL-CommResourcePool-r12

SL-CommTxPoolListExt-r13 ::= SEQUENCE (SIZE (1..maxSL-TxPool-v1310)) OF SL-CommResourcePool-r12

SL-CommTxPoolListV2X-r14 ::= SEQUENCE (SIZE (1..maxSL-V2X-TxPool-r14)) OF SL-CommResourcePoolV2X-r14

SL-CommRxPoolList-r12 ::= SEQUENCE (SIZE (1..maxSL-RxPool-r12)) OF SL-CommResourcePool-r12

SL-CommRxPoolListV2X-r14 ::= SEQUENCE (SIZE (1..maxSL-V2X-RxPool-r14)) OF SL-CommResourcePoolV2X-r14

SL-CommResourcePool-r12 ::= SEQUENCE {

sc-CP-Len-r12 SL-CP-Len-r12,

sc-Period-r12 SL-PeriodComm-r12,

sc-TF-ResourceConfig-r12 SL-TF-ResourceConfig-r12,

data-CP-Len-r12 SL-CP-Len-r12,

dataHoppingConfig-r12 SL-HoppingConfigComm-r12,

ue-SelectedResourceConfig-r12 SEQUENCE {

data-TF-ResourceConfig-r12 SL-TF-ResourceConfig-r12,

trpt-Subset-r12 SL-TRPT-Subset-r12 OPTIONAL -- Need OP

} OPTIONAL, -- Need OR

rxParametersNCell-r12 SEQUENCE {

tdd-Config-r12 TDD-Config OPTIONAL, -- Need OP

syncConfigIndex-r12 INTEGER (0..15)

} OPTIONAL, -- Need OR

txParameters-r12 SEQUENCE {

sc-TxParameters-r12 SL-TxParameters-r12,

dataTxParameters-r12 SL-TxParameters-r12

} OPTIONAL, -- Cond Tx

...,

[[ priorityList-r13 SL-PriorityList-r13 OPTIONAL -- Cond Tx

]]

}

SL-CommResourcePoolV2X-r14 ::= SEQUENCE {

sl-OffsetIndicator-r14 SL-OffsetIndicator-r12 OPTIONAL, -- Need OR

sl-Subframe-r14 SubframeBitmapSL-r14,

adjacencyPSCCH-PSSCH-r14 BOOLEAN,

sizeSubchannel-r14 ENUMERATED {

n4, n5, n6, n8, n9, n10, n12, n15, n16, n18, n20, n25, n30,

n48, n50, n72, n75, n96, n100, spare13, spare12, spare11,

spare10, spare9, spare8, spare7, spare6, spare5, spare4,

spare3, spare2, spare1},

numSubchannel-r14 ENUMERATED {n1, n3, n5, n8, n10, n15, n20, spare1},

startRB-Subchannel-r14 INTEGER (0..99),

startRB-PSCCH-Pool-r14 INTEGER (0..99) OPTIONAL, -- Need OR

rxParametersNCell-r14 SEQUENCE {

tdd-Config-r14 TDD-Config OPTIONAL, -- Need OP

syncConfigIndex-r14 INTEGER (0..15)

} OPTIONAL, -- Need OR

dataTxParameters-r14 SL-TxParameters-r12 OPTIONAL, -- Cond Tx

zoneID-r14 INTEGER (0..7) OPTIONAL, -- Need OR

threshS-RSSI-CBR-r14 INTEGER (0..45) OPTIONAL, -- Need OR

poolReportId-r14 SL-V2X-TxPoolReportIdentity-r14 OPTIONAL, -- Need OR

cbr-pssch-TxConfigList-r14 SL-CBR-PPPP-TxConfigList-r14 OPTIONAL, -- Need OR

resourceSelectionConfigP2X-r14 SL-P2X-ResourceSelectionConfig-r14 OPTIONAL, -- Cond P2X

syncAllowed-r14 SL-SyncAllowed-r14 OPTIONAL, -- Need OR

restrictResourceReservationPeriod-r14 SL-RestrictResourceReservationPeriodList-r14 OPTIONAL, -- Need OR

...,

[[ sl-MinT2ValueList-r15 SL-MinT2ValueList-r15 OPTIONAL, -- Need OR

cbr-pssch-TxConfigList-v1530 SL-CBR-PPPP-TxConfigList-v1530 OPTIONAL -- Need OR

]]

}

SL-TRPT-Subset-r12 ::= BIT STRING (SIZE (3..5))

SL-V2X-TxPoolReportIdentity-r14::= INTEGER (1..maxSL-PoolToMeasure-r14)

SL-MinT2ValueList-r15 ::= SEQUENCE (SIZE (1..maxSL-Prio-r13)) OF SL-MinT2Value-r15

SL-MinT2Value-r15 ::= SEQUENCE {

priorityList-r15 SL-PriorityList-r13,

minT2Value-r15 INTEGER (10..20)

}

-- ASN1STOP

| *SL-CommResourcePool* field descriptions |
| --- |
| ***adjacencyPSCCH-PSSCH***  Indicates whether a UE shall always transmit PSCCH and PSSCH in adjacent RBs (indicated by TRUE) or in non-adjacent RBs (indicated by FALSE) (see TS 36.213 [23]). |
| ***cbr-pssch-TxConfigList***  Indicates the mapping between PPPPs, CBR ranges by using indexes of the entry in cbr-RangeCommonConfigList, and PSSCH transmission parameters and CR limit by using indexes of the entry in sl-CBR-PSSCH-TxConfigList.  If *SL-CommResourcePoolV2X* is included in *MobilityControlInfoV2X*, it refers to *cbr-MobilityTxConfigList* for *cbr-RangeCommonConfigList* and *sl-CBR-PSSCH-TxConfigList.* If *SL-CommResourcePoolV2X* is included in *SL-V2X-ConfigDedicated*, it refers to *cbr-DedicatedTxConfigList* for *cbr-RangeCommonConfigList* and *sl-CBR-PSSCH-TxConfigList*. Otherwise, it refers to *cbr-CommonTxConfigList* included in the *SystemInformationBlockType21* of the serving cell / PCell for *cbr-RangeCommonConfigList* and *sl-CBR-PSSCH-TxConfigList*. |
| ***minT2Value***  Indicates the minimum value of T2 that applies to the PPPP(s), as specified in TS 36.300 [9], included in *priorityList*. |
| ***numSubchannel***  indicates the number of subchannels in the corresponding resource pool (see TS 36.213 [23]). |
| ***poolReportId***  The identity of the transmission resource pool used for CBR measurement reporting, which is corresponding to the *poolIdentity* reported in *measResultListCBR*. This field is only present in the transmission pools configured in *RRCConnectionReconfiguration* and *v2x-CommTxPoolExceptional, p2x-CommTxPoolNormalCommon, v2x-CommTxPoolNormalCommon, v2x-CommTxPoolNormal in SystemInformationBlockType21* or *SystemInformationBlockType26*. Otherwise, the field is absent. |
| ***resourceSelectionConfigP2X***  Indicates the allowed resource selection mechanism(s), i.e. partial sensing and/or random selection, for P2X related V2X sidelink communication. |
| ***restrictResourceReservationPeriod***  If configured, the field *restrictResourceReservationPeriod* configured in *v2x-ResourceSelectionConfig* shall be ignored for transmission on this pool. |
| ***sc-Period***  Indicates the period over which resources are allocated in a cell for SC and over which scheduled and UE selected data transmissions occur, see PSCCH period in TS 36.213 [23]. Value in number of subframes. Value sf40 corresponds to 40 subframes, sf80 corresponds to 80 subframes and so on. E-UTRAN configures values sf40, sf80, sf160 and sf320 for FDD and for TDD config 1 to 5, values sf70, sf140 and sf280 for TDD config 0, and finally values sf60, sf120 and sf240 for TDD config 6. |
| ***sizeSubchannel***  Indicates the number of PRBs of each subchannel in the corresponding resource pool (see TS 36.213 [23]). The value n5 denotes 5 PRBs; n6 denotes 6 PRBs and so on. E-UTRAN configures values n5, n6, n10, n15, n20, n25, n50, n75 and n100 in the case of *adjacencyPSCCH-PSSCH* set to TRUE; otherwise, E-UTRAN configures values n4, n5, n6, n8, n9, n10, n12, n15, n16, n18, n20, n30, n48, n72 and n96 in the case of *adjacencyPSCCH-PSSCH* set to FALSE, |
| ***sl-minT2ValueList***  Indicates a list of minimum value sets for the parameter T2 which is used for UE autonomous resource selection in this resource pool (see TS 36.213 [23]). |
| ***sl-OffsetIndicator***  Indicates the offset of the first subframe of a resource pool, i.e., the starting subframe of the repeating bitmap *sl-Subframe*, within a SFN cycle. If absent, the resource pool starts from first subframe of SFN=0. This field is not applicable to V2X sidelink communication. |
| ***sl-Subframe***  Indicates the bitmap of the resource pool, which is defined by repeating the bitmap within a SFN cycle (see TS 36.213 [23]). |
| ***startRB-PSCCH-Pool***  Indicates the lowest RB index of the PSCCH pool (see TS 36.213 [23]). This field is absent when a pool is (pre)configured such that a UE always transmits SC and data in adjacent RBs in the same subframe. |
| ***startRB-Subchannel***  Indicates the lowest RB index of the subchannel with the lowest index (see TS 36.213 [23]). |
| ***syncAllowed***  Indicates the allowed synchronization reference(s) which is (are) allowed to use the configured resource pool. |
| ***syncConfigIndex***  Indicates the synchronisation configuration that is associated with a reception pool, by means of an index to the corresponding entry of *commSyncConfig* in *SystemInformationBlockType18* for sidelink communication*, or* by means of an index to the corresponding entry of *v2x-SyncConfig* in *SystemInformationBlockType21* or *SystemInformationBlockType26* for V2X sidelink communication. |
| ***tdd-Config***  TDD configuration associated with the reception pool of the cell indicated by *syncConfigIndex*. Absence of the field indicates that the duplex mode is FDD and no TDD specific physical channel configuration is applicable. |
| ***threshS-RSSI-CBR***  Indicates the S-RSSI threshold for determining the contribution of a sub-channel to the CBR measurement, as specified in TS 36.214 [48]. Value 0 corresponds to -112 dBm, value 1 to -110 dBm, value n to (-112 + n\*2) dBm, and so on. |
| ***trpt-Subset***  Indicates the subset of T-RPT available (see TS 36.213 [23], clause 14.1.1.1.1). Consists of a bitmap which is used to indicate the set of available 'k' values to be used for sidelink communication (see TS 36.213 [23], clause 14.1.1.3). If T-RPT subset configuration is not signaled/ preconfigured then UE assumes the whole T-RPT set is available. |
| ***zoneID***  Indicates the zone ID for which the UE shall use this resource pool as described in 5.10.13.2. The field is absent in *v2x-CommTxPoolExceptional, p2x-CommTxPoolNormalCommon*, *p2x- CommTxPoolNormal* and *v2x-CommRxPool* in SIB21, in SIB26 or in *mobilityControlInfoV2X*. |

| Conditional presence | Explanation |
| --- | --- |
| *Tx* | The field is mandatory present when included in *commTxPoolNormalDedicated*, *commTxPoolNormalDedicatedExt*, *commTxPoolNormalCommon*, *commTxPoolNormalCommonExt,* *commTxPoolExceptional*, *sc-CommTxConfig*, *v2x-CommTxPoolNormalCommon*, *v2x-CommTxPoolExceptional,* *v2x-CommTxPoolNormalDedicated*, *p2x-CommTxPoolNormalCommon* or *v2x-CommTxPoolNormal* and *p2x-CommTxPoolNormal* in *v2x-InterFreqInfoList*. Otherwise the field is not present. |
| *P2X* | The field is mandatory present when included in *p2x-CommTxPoolNormalCommon*, *v2x-CommTxPoolNormalDedicated* in *sl-V2X-ConfigDedicated* for P2X related V2X sidelink communication or *p2x-CommTxPoolNormal* in *v2x-InterFreqInfoList*. Otherwise the field is not present. |

#### – *SL-CommTxPoolSensingConfig*

The IE *SL-CommTxPoolSensingConfig* specifies V2X sidelink communication configurations used for UE autonomous resource selection.

*SL-CommTxPoolSensingConfig* information element

-- ASN1START

SL-CommTxPoolSensingConfig-r14 ::= SEQUENCE {

pssch-TxConfigList-r14 SL-PSSCH-TxConfigList-r14,

thresPSSCH-RSRP-List-r14 SL-ThresPSSCH-RSRP-List-r14,

restrictResourceReservationPeriod-r14 SL-RestrictResourceReservationPeriodList-r14 OPTIONAL, -- Need OR

probResourceKeep-r14 ENUMERATED {v0, v0dot2, v0dot4, v0dot6, v0dot8,

spare3,spare2, spare1},

p2x-SensingConfig-r14 SEQUENCE {

minNumCandidateSF-r14 INTEGER (1..13),

gapCandidateSensing-r14 BIT STRING (SIZE (10))

} OPTIONAL, -- Need OR

sl-ReselectAfter-r14 ENUMERATED {n1, n2, n3, n4, n5, n6, n7, n8, n9,

spare7, spare6, spare5, spare4, spare3, spare2,

spare1} OPTIONAL -- Need OR

}

-- ASN1STOP

| *SL-CommTxPoolSensingConfig* field descriptions |
| --- |
| ***gapCandidateSensing***  Indicates which subframe should be sensed when a certain subframe is considered as a candidate resource (see TS 36.213 [23]). |
| ***minNumCandidateSF***  Indicates the minimum number of subframes that are included in the possible candidate resources. |
| ***p2x-SensingConfig***  Indicates the sensing configuration for P2X related V2X sidelink communication transmission only. |
| ***probResourceKeep***  Indicates the probability with which the UE keeps the current resource when the resource reselection counter reaches zero for sensing based UE autonomous resource selection (see TS 36.321 [6]). |
| ***pssch-TxConfigList***  Indicates PSSCH TX parameters such as MCS, PRB number, retransmission number, associated to different UE absolute speeds and different synchronization reference types for UE autonomous resource selection (see TS 36.213 [23]). |
| ***restrictResourceReservationPeriod***  Indicates which values are allowed for the signaling of the resource reservation period in PSCCH. |
| ***sl-ReselectAfter***  Indicates the number of consecutive skipped transmissions before triggering resource reselection for V2X sidelink communication (see TS 36.321 [6]). |
| ***thresPSSCH-RSRP-List***  Indicates a list of 64 thresholds, and the threshold should be selected based on the priority in the decoded SCI and the priority in the SCI to be transmitted (see TS 36.213 [23]). A resource is excluded if it is indicated or reserved by a decoded SCI and PSSCH RSRP in the associated data resource is above a threshold. |

#### – *SL-CP-Len*

The IE *SL-CP-Len* indicates the cyclic prefix length, see TS 36.211 [21].

*SL-CP-Len* information element

-- ASN1START

SL-CP-Len-r12 ::= ENUMERATED {normal, extended}

-- ASN1STOP

#### – *SL-DiscConfig*

The IE *SL-DiscConfig* specifies the dedicated configuration information for sidelink discovery.

*SL-DiscConfig* information element

-- ASN1START

SL-DiscConfig-r12 ::= SEQUENCE {

discTxResources-r12 CHOICE {

release NULL,

setup CHOICE {

scheduled-r12 SEQUENCE {

discTxConfig-r12 SL-DiscResourcePool-r12 OPTIONAL, -- Need ON

discTF-IndexList-r12 SL-TF-IndexPairList-r12 OPTIONAL, -- Need ON

discHoppingConfig-r12 SL-HoppingConfigDisc-r12

OPTIONAL -- Need ON

},

ue-Selected-r12 SEQUENCE {

discTxPoolDedicated-r12 SEQUENCE {

poolToReleaseList-r12 SL-TxPoolToReleaseList-r12 OPTIONAL, -- Need ON

poolToAddModList-r12 SL-DiscTxPoolToAddModList-r12 OPTIONAL -- Need ON

} OPTIONAL -- Need ON

}

}

} OPTIONAL, -- Need ON

...,

[[ discTF-IndexList-v1260 CHOICE {

release NULL,

setup SEQUENCE {

discTF-IndexList-r12b SL-TF-IndexPairList-r12b

}

} OPTIONAL -- Need ON

]],

[[ discTxResourcesPS-r13 CHOICE {

release NULL,

setup CHOICE {

scheduled-r13 SL-DiscTxConfigScheduled-r13,

ue-Selected-r13 SEQUENCE {

discTxPoolPS-Dedicated-r13 SL-DiscTxPoolDedicated-r13

}

}

} OPTIONAL, -- Need ON

discTxInterFreqInfo-r13 CHOICE {

release NULL,

setup SEQUENCE {

discTxCarrierFreq-r13 ARFCN-ValueEUTRA-r9 OPTIONAL, -- Need OR

discTxRefCarrierDedicated-r13 SL-DiscTxRefCarrierDedicated-r13 OPTIONAL, -- Need OR

discTxInfoInterFreqListAdd-r13 SL-DiscTxInfoInterFreqListAdd-r13 OPTIONAL -- Need ON

}

} OPTIONAL, -- Need ON

gapRequestsAllowedDedicated-r13 BOOLEAN OPTIONAL, -- Need ON

discRxGapConfig-r13 CHOICE {

release NULL,

setup SL-GapConfig-r13

} OPTIONAL, -- Need ON

discTxGapConfig-r13 CHOICE {

release NULL,

setup SL-GapConfig-r13

} OPTIONAL, -- Need ON

discSysInfoToReportConfig-r13 CHOICE {

release NULL,

setup SL-DiscSysInfoToReportFreqList-r13

} OPTIONAL -- Need ON

]]

}

SL-DiscSysInfoToReportFreqList-r13 ::= SEQUENCE (SIZE (1..maxFreq)) OF ARFCN-ValueEUTRA-r9

SL-DiscTxInfoInterFreqListAdd-r13 ::= SEQUENCE {

discTxFreqToAddModList-r13 SEQUENCE (SIZE (1..maxFreq)) OF SL-DiscTxResourceInfoPerFreq-r13 OPTIONAL, -- Need ON

discTxFreqToReleaseList-r13 SEQUENCE (SIZE (1..maxFreq)) OF ARFCN-ValueEUTRA-r9 OPTIONAL, -- Need ON

...

}

SL-DiscTxResourceInfoPerFreq-r13 ::= SEQUENCE {

discTxCarrierFreq-r13 ARFCN-ValueEUTRA-r9,

discTxResources-r13 SL-DiscTxResource-r13 OPTIONAL, -- Need OR

discTxResourcesPS-r13 SL-DiscTxResource-r13 OPTIONAL, -- Need OR

discTxRefCarrierDedicated-r13 SL-DiscTxRefCarrierDedicated-r13 OPTIONAL, -- Need OR

discCellSelectionInfo-r13 CellSelectionInfoNFreq-r13 OPTIONAL, -- Need OR

...

}

SL-DiscTxResource-r13 ::= CHOICE {

release NULL,

setup CHOICE {

scheduled-r13 SL-DiscTxConfigScheduled-r13,

ue-Selected-r13 SL-DiscTxPoolDedicated-r13

}

}

SL-DiscTxPoolToAddModList-r12 ::= SEQUENCE (SIZE (1..maxSL-TxPool-r12)) OF SL-DiscTxPoolToAddMod-r12

SL-DiscTxPoolToAddMod-r12 ::= SEQUENCE {

poolIdentity-r12 SL-TxPoolIdentity-r12,

pool-r12 SL-DiscResourcePool-r12

}

SL-DiscTxConfigScheduled-r13 ::= SEQUENCE {

discTxConfig-r13 SL-DiscResourcePool-r12 OPTIONAL, -- Need ON

discTF-IndexList-r13 SL-TF-IndexPairList-r12b OPTIONAL, -- Need ON

discHoppingConfig-r13 SL-HoppingConfigDisc-r12 OPTIONAL,-- Need ON

...

}

SL-DiscTxPoolDedicated-r13 ::= SEQUENCE {

poolToReleaseList-r13 SL-TxPoolToReleaseList-r12 OPTIONAL, -- Need ON

poolToAddModList-r13 SL-DiscTxPoolToAddModList-r12 OPTIONAL -- Need ON

}

SL-TF-IndexPairList-r12 ::= SEQUENCE (SIZE (1..maxSL-TF-IndexPair-r12)) OF SL-TF-IndexPair-r12

SL-TF-IndexPair-r12 ::= SEQUENCE {

discSF-Index-r12 INTEGER (1.. 200) OPTIONAL, -- Need ON

discPRB-Index-r12 INTEGER (1.. 50) OPTIONAL -- Need ON

}

SL-TF-IndexPairList-r12b ::= SEQUENCE (SIZE (1..maxSL-TF-IndexPair-r12)) OF SL-TF-IndexPair-r12b

SL-TF-IndexPair-r12b ::= SEQUENCE {

discSF-Index-r12b INTEGER (0..209) OPTIONAL, -- Need ON

discPRB-Index-r12b INTEGER (0..49) OPTIONAL -- Need ON

}

SL-DiscTxRefCarrierDedicated-r13 ::= CHOICE {

pCell NULL,

sCell SCellIndex-r10

}

-- ASN1STOP

| *SL-DiscConfig* field descriptions |
| --- |
| ***discCellSelectionInfo***  Parameters that may be used by the UE to select/ reselect a cell on the concerned non serving frequency. If absent, the UE acquires the information from the target cell on the concerned frequency. See TS 36.304 [4], clause 11.4. |
| ***discSysInfoToReportConfig***  Indicates the request to start a *SidelinkUEInformation* procedure for reporting system information acquired during an inter-frequency discovery procedure. |
| ***discTF-IndexList***  Indicates a list of time-frequency resource indices pair where each pair of indices corresponds to one discovery message. E-UTRAN only configures *discTF-IndexList-r12b* when configuring the UE with scheduled SL discovery Tx resources. When receiving *discTF-IndexList-r12b*, the UE shall only consider this field (and hence ignore *discTF-IndexList-r12*, if included or previously configured). |
| ***discTxConfig***  Indicates the resources configuration used when E-UTRAN schedules Tx resources (i.e. the fields *discSF-Index* and *discPRB-Index* indicate the actual resources to be used). |
| ***discTxInterFreqInfo***  Indicates frequency applicable for the resources indicated by *discTxResources-r12* (i.e. original resource field may cover first inter-frequency), and possibly resource allocations on additional frequencies as may be indicated by field *discTxInfoInterFreqListAdd*. |
| ***discTxRefCarrierDedicated***  Indicates if the PCell or an SCell is to be used as reference for DL measurements and synchronization, instead of the DL frequency paired with the one used to transmit sidelink discovery announcements on, see TS 36.213 [23], clause 14.3.1. |
| ***discTxResources***  Indicates the resources assigned to the UE for discovery announcements, which can either be a pool from which the UE may select or a set of resources specifically assigned for use by the UE. |
| ***discTxResourcesPS***  Indicates the resources assigned to the UE for PS discovery announcements, which can either be a pool from which the UE may select or a set of resources specifically assigned for use by the UE. |
| ***SL-TF-IndexPair***  A pair of indices, one for the time domain and one for the frequency domain, indicating the start of resources within the pool covered by *discTxConfig*, see TS 36.211 [21], clause 9.5.6 for one discovery message. The upper limits of *discSF-Index* and *discPRB-Index* are defined in TS 36.213 [23], clause 14.3.1. |

#### – *SL-DiscResourcePool*

The IE *SL-DiscResourcePool* specifies the configuration information for an individual pool of resources for sidelink discovery.

*SL-DiscResourcePool* information element

-- ASN1START

SL-DiscTxPoolList-r12 ::= SEQUENCE (SIZE (1..maxSL-TxPool-r12)) OF SL-DiscResourcePool-r12

SL-DiscRxPoolList-r12 ::= SEQUENCE (SIZE (1..maxSL-RxPool-r12)) OF SL-DiscResourcePool-r12

SL-DiscResourcePool-r12 ::= SEQUENCE {

cp-Len-r12 SL-CP-Len-r12,

discPeriod-r12 ENUMERATED {rf32, rf64, rf128,

rf256, rf512, rf1024, rf16-v1310, spare},

numRetx-r12 INTEGER (0..3),

numRepetition-r12 INTEGER (1..50),

tf-ResourceConfig-r12 SL-TF-ResourceConfig-r12,

txParameters-r12 SEQUENCE {

txParametersGeneral-r12 SL-TxParameters-r12,

ue-SelectedResourceConfig-r12 SEQUENCE {

poolSelection-r12 CHOICE {

rsrpBased-r12 SL-PoolSelectionConfig-r12,

random-r12 NULL

},

txProbability-r12 ENUMERATED {p25, p50, p75, p100}

} OPTIONAL -- Need OR

} OPTIONAL, -- Cond Tx

rxParameters-r12 SEQUENCE {

tdd-Config-r12 TDD-Config OPTIONAL, -- Need OR

syncConfigIndex-r12 INTEGER (0..15)

} OPTIONAL, -- Need OR

...,

[[ discPeriod-v1310 CHOICE {

release NULL,

setup ENUMERATED {rf4, rf6, rf7, rf8,

rf12, rf14, rf24, rf28}

} OPTIONAL, -- Need ON

rxParamsAddNeighFreq-r13 CHOICE {

release NULL,

setup SEQUENCE {

physCellId-r13 PhysCellIdList-r13

}

} OPTIONAL, -- Need ON

txParamsAddNeighFreq-r13 CHOICE {

release NULL,

setup SEQUENCE {

physCellId-r13 PhysCellIdList-r13,

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

tdd-Config-r13 TDD-Config OPTIONAL, -- Cond TDD-OR

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

freqInfo SEQUENCE {

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

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

OPTIONAL, -- Need OP

additionalSpectrumEmission AdditionalSpectrumEmission

},

referenceSignalPower INTEGER (-60..50),

syncConfigIndex-r13 INTEGER (0..15) OPTIONAL -- Need OR

}

} OPTIONAL -- Need ON

]],

[[ txParamsAddNeighFreq-v1370 CHOICE {

release NULL,

setup SEQUENCE {

freqInfo-v1370 SEQUENCE {

additionalSpectrumEmission-v1370 AdditionalSpectrumEmission-v10l0

}

}

} OPTIONAL -- Need ON

]]

}

PhysCellIdList-r13 ::= SEQUENCE (SIZE (1.. maxSL-DiscCells-r13)) OF PhysCellId

SL-PoolSelectionConfig-r12 ::= SEQUENCE {

threshLow-r12 RSRP-RangeSL2-r12,

threshHigh-r12 RSRP-RangeSL2-r12

}

-- ASN1STOP

| *SL-DiscResourcePool* field descriptions |
| --- |
| ***discPeriod***  Indicates the period over which resources are allocated in a cell for discovery message transmission/reception, see PSDCH period in TS 36.213 [23]. Value in number of radio frames. Value rf32 corresponds to 32 radio frames, rf64 corresponds to 64 radio frames and so on. The extended values apply for PS discovery (not only for sidelink relaying). When broadcasting an extended value, E-UTRAN sets the original field to spare to ensure legacy UEs ignore the concerned pool entry. |
| ***numRepetition***  Indicates the number of times *subframeBitmap* is repeated for mapping to subframes that occurs within a *discPeriod*. The highest value E-UTRAN uses is value 5 for FDD and TDD configuration 0, value 13 for TDD configuration 1, value 25 for TDD configuration 2, value 17 for TDD configuration 3, value 25 for TDD configuration 4, value 50 for TDD configuration 5 and value 7 for TDD configuration 6. E-UTRAN configures *numRepetition* and *subframeBitmap* such that the mapped subframes do not exceed the *discPeriod*. |
| ***poolSelection***  Indicates the mechanism for selecting a (transmission) pool when multiple candidates are provided. E-UTRAN configures the same value (i.e. a pool selection method) for all candidate pools within one pool list (*discTxPoolCommon* or *discTxPoolDedicated*) but the pool selection method in different pool lists may or may not be the same. |
| ***syncConfigIndex***  Indicates the synchronisation configuration that is associated with a reception or transmission pool, by means of an index to the corresponding entry of *discSyncConfig* in *SystemInformationBlockType19*. |
| ***threshLow, threshHigh***  Specifies the thresholds used to select a resource pool in RSRP based pool selection. The E-UTRAN should configure *threshLow* and *threshHigh* such that the UE selects only one resource pool upon RSRP based pool selection. |
| ***txProbability***  Indicates the probability of transmitting announcement in a discovery period when configured with a pool of resources, see TS 36.321 [6]. |

| Conditional presence | Explanation |
| --- | --- |
| *TDD-OR* | The field is optional present for TDD, need OR; it is not present for FDD. |
| *Tx* | The field is mandatory present when included in *discTxPoolDedicated* or *discTxPoolCommon*. Otherwise the field is not present. |

#### – *SL-DiscSysInfoReport*

The IE *SL-DiscSysInfoReport* contains the parameters related to sidelink discovery acquired from system information of inter-frequency cells (including inter-PLMN).

*SL-DiscSysInfoReport* information element

-- ASN1START

SL-DiscSysInfoReport-r13 ::= SEQUENCE {

plmn-IdentityList-r13 PLMN-IdentityList OPTIONAL,

cellIdentity-13 CellIdentity OPTIONAL,

carrierFreqInfo-13 ARFCN-ValueEUTRA-r9 OPTIONAL,

discRxResources-r13 SL-DiscRxPoolList-r12 OPTIONAL,

discTxPoolCommon-r13 SL-DiscTxPoolList-r12 OPTIONAL,

discTxPowerInfo-r13 SL-DiscTxPowerInfoList-r12 OPTIONAL,

discSyncConfig-r13 SL-SyncConfigNFreq-r13 OPTIONAL,

discCellSelectionInfo-r13 SEQUENCE {

q-RxLevMin-r13 Q-RxLevMin,

q-RxLevMinOffset-r13 INTEGER (1..8) OPTIONAL

} OPTIONAL,

cellReselectionInfo-r13 SEQUENCE {

q-Hyst-r13 ENUMERATED {

dB0, dB1, dB2, dB3, dB4, dB5, dB6, dB8, dB10,

dB12, dB14, dB16, dB18, dB20, dB22, dB24},

q-RxLevMin-r13 Q-RxLevMin,

t-ReselectionEUTRA-r13 T-Reselection

} OPTIONAL,

tdd-Config-r13 TDD-Config OPTIONAL,

freqInfo-r13 SEQUENCE {

ul-CarrierFreq-r13 ARFCN-ValueEUTRA OPTIONAL,

ul-Bandwidth-r13 ENUMERATED {n6, n15, n25, n50, n75, n100}

OPTIONAL,

additionalSpectrumEmission-r13 AdditionalSpectrumEmission OPTIONAL

} OPTIONAL,

p-Max-r13 P-Max OPTIONAL,

referenceSignalPower-r13 INTEGER (-60..50) OPTIONAL,

...,

[[

freqInfo-v1370 SEQUENCE {

additionalSpectrumEmission-v1370 AdditionalSpectrumEmission-v10l0

} OPTIONAL

]]

}

-- ASN1STOP

| ***SL-DiscSysInfoReport* field descriptions** |
| --- |
| ***carrierFreqInfo***  Indicates the frequency of the cell from which the UE acquired the system information relevant for discovery |
| ***cellIdentity***  Indicated the identity of the cell from which the UE acquired the system information relevant for discovery |
| ***plmn-IdentityList***  Indicates the list of PLMN identity of the cell from which the UE acquired the system information relevant for discovery |

#### – *SL-DiscTxPowerInfo*

The IE *SL-DiscTxPowerInfo* specifies power control parameters for one or more power classes.

*SL-DiscTxPowerInfo* information element

-- ASN1START

SL-DiscTxPowerInfoList-r12 ::= SEQUENCE (SIZE (maxSL-DiscPowerClass-r12)) OF SL-DiscTxPowerInfo-r12

SL-DiscTxPowerInfo-r12 ::= SEQUENCE {

discMaxTxPower-r12 P-Max,

...

}

-- ASN1STOP

| *SL-DiscTxPowerInfo* field descriptions |
| --- |
| ***discMaxTxPower***  Indicates the P-Max parameter used to calculate the maximum transmit power a UE configured with the concerned range class, see TS 24.333 [70], clause 4.2.11. The first entry in *SL-DiscTxPowerInfoList* corresponds to UE range class 'short', the second entry corresponds to 'medium' and the third entry corresponds to 'long'. |

#### – *SL-GapConfig*

The IE *SL-GapConfig* indicates the gaps, requested or assigned, to enable the UE to receive or transmit sidelink discovery, intra or inter frequency (includings inter-PLMN).

*SL-GapConfig* information element

-- ASN1START

SL-GapConfig-r13 ::= SEQUENCE {

gapPatternList-r13 SL-GapPatternList-r13

}

SL-GapPatternList-r13 ::= SEQUENCE (SIZE (1..maxSL-GP-r13)) OF SL-GapPattern-r13

SL-GapPattern-r13 ::= SEQUENCE {

gapPeriod-r13 ENUMERATED {sf40, sf60, sf70, sf80, sf120, sf140, sf160,

sf240, sf280, sf320, sf640, sf1280, sf2560, sf5120,

sf10240},

gapOffset-r12 SL-OffsetIndicator-r12,

gapSubframeBitmap-r13 BIT STRING (SIZE (1..10240)),

...

}

-- ASN1STOP

| *SL-GapConfig* field descriptions |
| --- |
| ***gapOffset***  Indicates the offset from the start of SFN 0 to the start of the first *gapPeriod*. If the SFN period is not an integer multiple of *gapPeriod*, no subframes within this period (i.e. from SFN 0 to offset) are considered part of the gap. | |
| ***gapPeriod***  Indicates the period by which *gapSubframeBitmap* is repeated. | |
| ***gapSubframeBitmap***  Indicates the subframes of one or more individual gaps, not only covering the subframes of the associated discovery resources but also including e.g. re-tuning and synchronisation delays. The UE and E-UTRAN signal bit strings of valid sizes only i.e. sizes equal to or less than *gapPeriod*. Value 1 indicates that the UE is allowed to use the subframe for sidelink discovery. |

#### – *SL-GapRequest*

The IE *SL-GapRequest* indicates the gaps requested by the UE to receive or transmit sidelink discovery, intra or inter frequency (includings inter-PLMN).

*SL-GapRequest* information element

-- ASN1START

SL-GapRequest-r13 ::= SEQUENCE (SIZE (1..maxFreq)) OF SL-GapFreqInfo-r13

SL-GapFreqInfo-r13 ::= SEQUENCE {

carrierFreq-r13 ARFCN-ValueEUTRA-r9 OPTIONAL,

gapPatternList-r13 SL-GapPatternList-r13

}

-- ASN1STOP

#### – *SL-HoppingConfig*

The IE *SL-HoppingConfig* indicates the hopping configuration used for sidelink.

*SL-HoppingConfig* information element

-- ASN1START

SL-HoppingConfigComm-r12 ::= SEQUENCE {

hoppingParameter-r12 INTEGER (0..504),

numSubbands-r12 ENUMERATED {ns1, ns2, ns4},

rb-Offset-r12 INTEGER (0..110)

}

SL-HoppingConfigDisc-r12 ::= SEQUENCE {

a-r12 INTEGER (1..200),

b-r12 INTEGER (1..10),

c-r12 ENUMERATED {n1, n5}

}

-- ASN1STOP

| *SL-HoppingConfig* field descriptions |
| --- |
| ***a***  Per cell parameter:  see TS 36.213 [23], clause 14.3.1. |
| ***b***  Per UE parameter:  see TS 36.213 [23], clause 14.3.1. |
| ***c***  Per cell parameter:  see TS 36.213 [23], clause 14.3.1. |
| ***hoppingParameter***  Affects the hopping performed as specificed in TS 36.213 [23], clauses 14.1.1.2 and 14.1.1.4. In case value 504 is received, the value used by the UE is 510. |
| ***numSubbands***  Parameter: Nsb see TS 36.211 [21], clause 9.3.6. |
| ***rb-Offset***  Parameter: , see TS 36.211 [21], clause 9.3.6. |

#### – *SL-InterFreqInfoListV2X*

The IE *SL-InterFreqInfoListV2X* indicates synchronization and resource allocation configurations of the neighboring frequency for V2X sidelink communication.

*SL-InterFreqInfoListV2X* information element

-- ASN1START

SL-InterFreqInfoListV2X-r14 ::= SEQUENCE (SIZE (0..maxFreqV2X-1-r14)) OF SL-InterFreqInfoV2X-r14

SL-InterFreqInfoV2X-r14 ::= SEQUENCE {

plmn-IdentityList-r14 PLMN-IdentityList OPTIONAL, -- Need OP

v2x-CommCarrierFreq-r14 ARFCN-ValueEUTRA-r9,

sl-MaxTxPower-r14 P-Max OPTIONAL, -- Need OR

sl-Bandwidth-r14 ENUMERATED {n6, n15, n25, n50, n75, n100} OPTIONAL, -- Need OR

v2x-SchedulingPool-r14 SL-CommResourcePoolV2X-r14 OPTIONAL, -- Need OR

v2x-UE-ConfigList-r14 SL-V2X-UE-ConfigList-r14 OPTIONAL, -- Need OR

...,

[[ additionalSpectrumEmissionV2X-r14 CHOICE {

additionalSpectrumEmission-r14 AdditionalSpectrumEmission,

additionalSpectrumEmission-v1440 AdditionalSpectrumEmission-v10l0

} OPTIONAL -- Need ON

]],

[[ v2x-FreqSelectionConfigList-r15 SL-V2X-FreqSelectionConfigList-r15 OPTIONAL --Need OR

]]

}

-- ASN1STOP

| *SL-InterFreqInfoListV2X* field descriptions |
| --- |
| ***plmn-IdentityList***  Indicates PLMN identities of this frequency for reception of V2X sidelink communication. If this field is not present, the UE considers this frequency for reception of V2X sidelink communication concerns the first PLMN entry in the *plmn-IdentityLis*t in *SystemInformationBlockType1*. |
| ***sl-MaxTxPower***  Indicates the maximum transmission power for transmitting V2X sidelink communication on the corresponding frequency. |
| ***additionalSpectrumEmissionV2X***  Indicates the *additionalSpectrumEmission* valuedefined in TS 36.101 [42], clause 6.2.4,for V2X sidelink communication. |
| ***v2x-FreqSelectionConfigList***  Indicates the configuration information for the carrier selection for V2X sidelink communication transmission. The configuration applies to the carrier frequency identified by *v2x-CommCarrierFreq* (i.e. carrier specific configuration). |
| ***v2x-SchedulingPool***  Indicates the resource pool for inter-carrier scheduled resource allocation. This field is configured in RRC dedicated signalling only when *scheduled* is configured in IE *SL-V2X-ConfigDedicated*. |
| ***v2x-UE-ConfigList***  Indicates the inter-carrier resource configuration. If there is only one entry in the list without *physCellId* configured, the configuration is applied to the frequency identified by *v2x-CommCarrierFreq* (i.e. carrier specific configuration); if the entry of this field includes *physCellIdList*, the configuration is applied to the cell(s) identified by *physCellIdList* (i.e. cell specific configuration). |

#### – *SL-NR-AnchorCarrierFreqList*

The IE *SL-NR-AnchorCarrierFreqList* specifies the NR anchor frequencies i.e. frequencies that include inter-carrier resource configuration for V2X sidelink communication.

*SL-NR-AnchorCarrierFreqList* information element

-- ASN1START

SL-NR-AnchorCarrierFreqList-r16 ::= SEQUENCE (SIZE (1..maxFreqSL-NR-r16)) OF ARFCN-ValueNR-r15

-- ASN1STOP

#### – *SL-V2X-UE-ConfigList*

The IE *SL-V2X-UE-ConfigList* indicates inter-frequency resource configuration per-carrier or per-cell.

*SL-V2X-UE-ConfigList* information element

-- ASN1START

SL-V2X-UE-ConfigList-r14 ::= SEQUENCE (SIZE (1.. maxCellIntra)) OF SL-V2X-InterFreqUE-Config-r14

SL-V2X-InterFreqUE-Config-r14 ::= SEQUENCE {

physCellIdList-r14 PhysCellIdList-r13 OPTIONAL, -- Need OR

typeTxSync-r14 SL-TypeTxSync-r14 OPTIONAL, -- Need OR

v2x-SyncConfig-r14 SL-SyncConfigListNFreqV2X-r14 OPTIONAL, -- Need OR

v2x-CommRxPool-r14 SL-CommRxPoolListV2X-r14 OPTIONAL, -- Need OR

v2x-CommTxPoolNormal-r14 SL-CommTxPoolListV2X-r14 OPTIONAL, -- Need OR

p2x-CommTxPoolNormal-r14 SL-CommTxPoolListV2X-r14 OPTIONAL, -- Need OR

v2x-CommTxPoolExceptional-r14 SL-CommResourcePoolV2X-r14 OPTIONAL, -- Need OR

v2x-ResourceSelectionConfig-r14 SL-CommTxPoolSensingConfig-r14 OPTIONAL, -- Need OR

zoneConfig-r14 SL-ZoneConfig-r14 OPTIONAL, -- Need OR

offsetDFN-r14 INTEGER (0..1000) OPTIONAL, -- Need OR

...

}

-- ASN1STOP

| *SL-V2X-UE-ConfigList* field descriptions |
| --- |
| ***offsetDFN***  Indicates the timing offset for the UE to determine DFN timing when GNSS is used for timing reference. Value 0 corresponds to 0 milliseconds, value 1 corresponds to 0.001 milliseconds, value 2 corresponds to 0.002 milliseconds, and so on. |
| ***p2x-CommTxPoolNormal***  Indicates the resources on a carrier frequency by which the UE may transmit P2X related V2X sidelink communication. |
| ***physCellIdList***  If configured, the resource configuration is applicable for the cell(s) identified by this field. Otherwise, the resource configuration is for a given carrier frequency. |
| ***typeTxSync***  Indicates the prioritized synchronization type (i.e. eNB or GNSS) for performing V2X sidelink communication on a carrier frequency. |
| ***v2x-CommRxPool***  Indicates the resources on a carrier frequency by which the UE may receive V2X sidelink communication. This field is absent within *v2x-InterFreqInfoList* included in *RRCConnectionReconfiguration* except if received with *MobilityControlInfo* or *MobilityControlInfoV2X*. |
| ***v2x-CommTxPoolExceptional***  Indicates the resources on a carrier frequency by which the UE may transmit V2X sidelink communication in exceptional conditions, as specified in 5.10.13. |
| ***v2x-CommTxPoolNormal***  Indicates the resources on a carrier frequency by which the UE may transmit V2X sidelink communication. |
| ***v2x-SyncConfig***  Indicates the synchronization configuration used for transmission/reception of SLSS on the given frequency. |

#### – *SL-OffsetIndicator*

The IE *SL-OffsetIndicator* indicates the offset of the pool of resources relative to SFN 0 of the cell from which it was obtained or, when out of coverage, relative to DFN 0.

*SL-OffsetIndicator* information element

-- ASN1START

SL-OffsetIndicator-r12 ::= CHOICE {

small-r12 INTEGER (0..319),

large-r12 INTEGER (0..10239)

}

SL-OffsetIndicatorSync-r12 ::= INTEGER (0..39)

SL-OffsetIndicatorSync-v1430 ::= INTEGER (40..159)

SL-OffsetIndicatorSync-r14 ::= INTEGER (0..159)

-- ASN1STOP

| *SL-OffsetIndicator* field descriptions |
| --- |
| ***SL-OffsetIndicator***  In *sc-TF-ResourceConfig*, it indicates the offset of the first period of pool of resources within a SFN cycle. For *data-TF-ResourceConfig*, it corresponds to the *offsetIndicator* as defined in TS 36.213 [23], clause 14.1.3. |
| ***SL-OffsetIndicatorSync***  For sidelink discovery and sidelink communication, synchronisation resources are present in those SFN and subframes which satisfy the relation: (SFN\*10+ *Subframe Number*) mod 40 = *SL-OffsetIndicatorSync*. For V2X sidelink communication, synchronisation resources are present in those SFN and subframes which satisfy the relation: (SFN\*10+ *Subframe Number*) mod 160 = *SL-OffsetIndicatorSync*. |

#### – *SL-P2X-ResourceSelectionConfig*

The IE *SL-P2X-ResourceSelectionConfig* includes the configuration of resource selection for P2X related V2X sidelink communication. E-UTRAN configures at least one resource selection mechanism.

*SL-P2X-ResourceSelectionConfig* information element

-- ASN1START

SL-P2X-ResourceSelectionConfig-r14 ::= SEQUENCE {

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

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

}

-- ASN1STOP

| *SL-P2X-ResourceSelectionConfig* field descriptions |
| --- |
| ***partialSensing***  Indicates that partial sensing is allowed for UE autonomous resource selection in a resource pool. |
| ***randomSelection***  Indicates that random selection is allowed for UE autonomous resource selection in a resource pool. |

#### – *SL-PeriodComm*

The IE *SL-PeriodComm* indicates the period over which resources allocated in a cell for sidelink communication.

*SL-PeriodComm* information element

-- ASN1START

SL-PeriodComm-r12 ::= ENUMERATED {sf40, sf60, sf70, sf80, sf120, sf140,

sf160, sf240, sf280, sf320, spare6, spare5,

spare4, spare3, spare2, spare}

-- ASN1STOP

#### – *SL-Priority*

The IE *SL-Priority* indicates the one or more priorities of resource pool used for sidelink communication, or of a logical channel group used in case of scheduled sidelink communication resources, see TS 36.321 [6].

*SL-Priority* information element

-- ASN1START

SL-PriorityList-r13 ::= SEQUENCE (SIZE (1..maxSL-Prio-r13)) OF SL-Priority-r13

SL-Priority-r13 ::= INTEGER (1..8)

-- ASN1STOP

#### – *SL-PSSCH-TxConfigList*

The IE *SL-PSSCH-TxConfigList* indicates PSSCH transmission parameters. When lower layers select parameters from the range indicated in IE *SL-PSSCH-TxConfigList*, the UE considers both configurations in IE *SL-PSSCH-TxConfigList* and the CBR-dependent configurations represented in IE *SL-CBR-PPPP-TxConfigList*. Only one IE *SL-PSSCH-TxConfig* is provided per *typeTxSync*.

*SL-PSSCH-TxConfigList* information element

-- ASN1START

SL-PSSCH-TxConfigList-r14 ::= SEQUENCE (SIZE (1..maxPSSCH-TxConfig-r14)) OF SL-PSSCH-TxConfig-r14

SL-PSSCH-TxConfig-r14 ::= SEQUENCE {

typeTxSync-r14 SL-TypeTxSync-r14 OPTIONAL, -- Need OR

thresUE-Speed-r14 ENUMERATED {kmph60, kmph80, kmph100, kmph120,

kmph140, kmph160, kmph180, kmph200},

parametersAboveThres-r14 SL-PSSCH-TxParameters-r14,

parametersBelowThres-r14 SL-PSSCH-TxParameters-r14,

...,

[[ parametersAboveThres-v1530 SL-PSSCH-TxParameters-v1530 OPTIONAL, -- Need OR

parametersBelowThres-v1530 SL-PSSCH-TxParameters-v1530 OPTIONAL -- Need OR

]]

}

SL-PSSCH-TxParameters-r14 ::= SEQUENCE {

minMCS-PSSCH-r14 INTEGER (0..31),

maxMCS-PSSCH-r14 INTEGER (0..31),

minSubChannel-NumberPSSCH-r14 INTEGER (1..20),

maxSubchannel-NumberPSSCH-r14 INTEGER (1..20),

allowedRetxNumberPSSCH-r14 ENUMERATED {n0, n1, both, spare1},

maxTxPower-r14 SL-TxPower-r14 OPTIONAL -- Cond CBR

}

SL-PSSCH-TxParameters-v1530 ::= SEQUENCE {

minMCS-PSSCH-r15 INTEGER (0..31),

maxMCS-PSSCH-r15 INTEGER (0..31)

}

-- ASN1STOP

| *SL-PSSCH-TxConfigList* field descriptions |
| --- |
| ***allowedRetxNumberPSSCH***  Indicates the allowed retransmission number for transmissions on PSSCH (see TS 36.213 [23]). The value n0 indicates no retransmission for a transport block allowed; the value n1 indicates that the UE shall perform one retransmission for a transport block; and the value both indicates that the UE may autonomously select no retransmission or one retransmission for a transport block. |
| ***maxTxPower***  Indicates the maximum transmission power for transmission on PSSCH and PSCCH (see TS 36.213 [23]). |
| ***minMCS-PSSCH, maxMCS-PSSCH***  Indicates the minimum and maximum MCS values used for transmissions on PSSCH (see TS 36.213 [23]). If included, *minMCS-PSSCH-r14* and *maxMCS-PSSCH-r14* correspond to the MCS table in Table 8.6.1-1 with 64QAM indices overridden by 16QAM used for transmission on PSSCH. If included, *minMCS-PSSCH-r15* and *maxMCS-PSSCH-r15* correspond to both the MCS table in Table 8.6.1-1 and Table 14.1.1-2 in TS 36.213 [23] used for transmission on PSSCH. |
| ***minSubchannel-NumberPSSCH, maxSubchannel-NumberPSSCH***  Indicates the minimum and maximum number of sub-channels which may be used for transmissions on PSSCH (see TS 36.213 [23]). |
| ***thresUE-Speed***  Indicates a UE speed threshold. |
| ***typeTxSync***  Indicates the synchronization reference type (see TS 36.213 [23]). For configurations by the eNB, only *gnss* and *enb* can be configured; and for pre-configuration, only *gnss* and *ue* can be configured. If the field is absent, the configuration is applicable for all synchronization reference types. |
| ***parametersAboveThres***  Indicates TX parameters for the UE speed above *thresUE-Speed*. |
| ***parametersBelowThres***  Indicates TX parameters for the UE speed below *thresUE-Speed*. |

| Conditional presence | Explanation |
| --- | --- |
| *CBR* | The field is optionally present, need OR, in IE *SL-CBR-CommonTxConfigList-r14, or in IE SL-CBR-PreconfigTxConfigList-r14*. Otherwise the field is not present. Need OR. |

#### *– SL-Reliability*

The IE *SL-Reliability* indicates one or more reliabilities of a logical channel group used in case of scheduled sidelink communication resources or traffic reliability(ies) associated with the reported traffic pattern for V2X sidelink communication; see TS 36.321 [6].

***SL-Reliability* information element**

-- ASN1START

SL-ReliabilityList-r15 ::= SEQUENCE (SIZE (1..maxSL-Reliability-r15)) OF SL-Reliability-r15

SL-Reliability-r15 ::= INTEGER (1..8)

-- ASN1STOP

#### – *SL-RestrictResourceReservationPeriodList*

The IE *SL-RestrictResourceReservationPeriodList* indicates which values are allowed for the signaling of the resource reservation period in PSCCH for V2X sidelink communication, see TS 36.321 [6].

*SL-RestrictResourceReservationPeriodList* information element

-- ASN1START

SL-RestrictResourceReservationPeriodList-r14 ::= SEQUENCE (SIZE (1..maxReservationPeriod-r14)) OF SL-RestrictResourceReservationPeriod-r14

SL-RestrictResourceReservationPeriod-r14 ::= ENUMERATED {v0dot2, v0dot5, v1, v2, v3, v4, v5, v6, v7, v8, v9, v10, spare4,spare3, spare2, spare1}

-- ASN1STOP

| *SL-RestrictResourceReservationPeriodList* field descriptions |
| --- |
| ***SL-RestrictResourceReservationPeriod***  Value *v0dot2* means *SL-RestrictResourceReservationPeriod* is set to 0.2, value *v0dot5* means *SL-RestrictResourceReservationPeriod* is set to 0.5, value *v1* means *SL-RestrictResourceReservationPeriod* is set to 1, and so on. Value *v0dot2* andvalue *v0dot5* are configured in a pool-specific manner only. E-UTRAN should not set value *v0dot2* and *v0dot5* for transmission pool for P2X related V2X sidelink communication. |

#### – *SLSSID*

The IE *SLSSID* identifies a cell and is used by the receiving UE to detect asynchronous neighbouring cells, and by transmitting UEs to extend the synchronisation signals beyond the cell's coverage area.

*SLSSID* information element

-- ASN1START

SLSSID-r12 ::= INTEGER (0..167)

-- ASN1STOP

#### – *SL-SyncAllowed*

The IE *SL-SyncAllowed* indicates the allowed the synchronization references for a transmission resource pool for V2X sidelink communication.

*SL-SyncAllowed* information element

-- ASN1START

SL-SyncAllowed-r14 ::= SEQUENCE {

gnss-Sync-r14 ENUMERATED {true} OPTIONAL, -- Need OR

enb-Sync-r14 ENUMERATED {true} OPTIONAL, -- Need OR

ue-Sync-r14 ENUMERATED {true} OPTIONAL -- Need OR

}

-- ASN1STOP

| *SL-SyncAllowed* field descriptions |
| --- |
| ***enb-Sync***  If configured, the (pre-) configured resources can be used if the UE is directly or indirectly synchronized to eNB (i.e., synchronized to a reference UE which is directly synchronized to eNB). |
| ***gnss-Sync***  If configured, the (pre-) configured resources can be used if the UE is directly or indirectly synchronized to GNSS (i.e. synchronized to a reference UE which is directly synchronized to GNSS). |
| ***ue-Sync***  If configured, the (pre-) configured resources can be used if the UE is synchronized to a reference UE which is synchronized to neither GNSS nor eNB directly or indirectly. |

#### – *SL-SyncConfig*

The IE *SL-SyncConfig* specifies the configuration information concerning reception of synchronisation signals from neighbouring cells as well as concerning the transmission of synchronisation signals for sidelink communication and sidelink discovery.

*SL-SyncConfig* information element

-- ASN1START

SL-SyncConfigList-r12 ::= SEQUENCE (SIZE (1..maxSL-SyncConfig-r12)) OF SL-SyncConfig-r12

SL-SyncConfigListV2X-r14 ::= SEQUENCE (SIZE (1.. maxSL-V2X-SyncConfig-r14)) OF SL-SyncConfig-r12

SL-SyncConfig-r12 ::= SEQUENCE {

syncCP-Len-r12 SL-CP-Len-r12,

syncOffsetIndicator-r12 SL-OffsetIndicatorSync-r12,

slssid-r12 SLSSID-r12,

txParameters-r12 SEQUENCE {

syncTxParameters-r12 SL-TxParameters-r12,

syncTxThreshIC-r12 RSRP-RangeSL-r12,

syncInfoReserved-r12 BIT STRING (SIZE (19)) OPTIONAL -- Need OR

} OPTIONAL, -- Need OR

rxParamsNCell-r12 SEQUENCE {

physCellId-r12 PhysCellId,

discSyncWindow-r12 ENUMERATED {w1, w2}

} OPTIONAL, -- Need OR

...,

[[ syncTxPeriodic-r13 ENUMERATED {true} OPTIONAL -- Need OR

]],

[[ syncOffsetIndicator-v1430 SL-OffsetIndicatorSync-v1430 OPTIONAL, -- Need OR

gnss-Sync-r14 ENUMERATED {true} OPTIONAL -- Need OR

]],

[[ syncOffsetIndicator2-r14 SL-OffsetIndicatorSync-r14 OPTIONAL, -- Need OR

syncOffsetIndicator3-r14 SL-OffsetIndicatorSync-r14 OPTIONAL -- Need OR

]],

[[ slss-TxDisabled-r15 ENUMERATED {true} OPTIONAL -- Need OR

]]

}

SL-SyncConfigListNFreq-r13 ::= SEQUENCE (SIZE (1..maxSL-SyncConfig-r12)) OF SL-SyncConfigNFreq-r13

SL-SyncConfigListNFreqV2X-r14 ::= SEQUENCE (SIZE (1..maxSL-V2X-SyncConfig-r14)) OF SL-SyncConfigNFreq-r13

SL-SyncConfigNFreq-r13 ::= SEQUENCE {

asyncParameters-r13 SEQUENCE {

syncCP-Len-r13 SL-CP-Len-r12,

syncOffsetIndicator-r13 SL-OffsetIndicatorSync-r12,

slssid-r13 SLSSID-r12

} OPTIONAL, -- Need OR

txParameters-r13 SEQUENCE {

syncTxParameters-r13 SL-TxParameters-r12,

syncTxThreshIC-r13 RSRP-RangeSL-r12,

syncInfoReserved-r13 BIT STRING (SIZE (19)) OPTIONAL, -- Need OR

syncTxPeriodic-r13 ENUMERATED {true} OPTIONAL -- Need OR

} OPTIONAL, -- Need OR

rxParameters-r13 SEQUENCE {

discSyncWindow-r13 ENUMERATED {w1, w2}

} OPTIONAL, -- Need OR

...,

[[ syncOffsetIndicator-v1430 SL-OffsetIndicatorSync-v1430 OPTIONAL, -- Need OR

gnss-Sync-r14 ENUMERATED {true} OPTIONAL -- Need OR

]],

[[ syncOffsetIndicator2-r14 SL-OffsetIndicatorSync-r14 OPTIONAL, -- Need OR

syncOffsetIndicator3-r14 SL-OffsetIndicatorSync-r14 OPTIONAL -- Need OR

]],

[[ slss-TxDisabled-r15 ENUMERATED {true} OPTIONAL -- Need OR

]]

}

-- ASN1STOP

| *SL-SyncConfig* field descriptions |
| --- |
| ***discSyncWindow***  Indicates the synchronization window over which the UE expects that SLSS or discovery resources indicated by the pool configuration (see TS 36.213 [23], clause 14.4). The value *w1* denotes 5 milliseconds. The value *w2* denotes the length corresponding to normal cyclic prefix divided by 2. |
| ***gnss-Sync***  if configured, the synchronization configuration is used for SLSS transmission/reception when the UE is synchronized to GNSS, by using slssid=0 and ignoring *slssid-r12* configured. If not configured, the synchronization configuration is used for SLSS transmission/reception when the UE is synchronized to eNB, by using the configured *slssid-r12*. |
| ***slss-TxDisabled***  Value TRUE indicates that the carrier, even though equipped with synchronisation resources, cannot be used as a synchronisation carrier frequency to transmit SLSS or PSBCH.  This parameter cannot be included in *SystemInformationBlockType21* or *SystemInformationBlockType26.* |
| ***syncCP-Len***  In case of V2X sidelink communications this field is always configured to *normal*. |
| ***syncInfoReserved***  Reserved for future use. |
| ***syncOffsetIndicator***  E-UTRAN should ensure *syncOffsetIndicator* is set to the same value as *syncOffsetIndicator1* or *syncOffsetIndicator2* in *preconfigSync* within *SL-Preconfiguration*, if configured. If *syncOffsetIndicator-v1430* is configured, the UE shall ignore the field *syncOffsetIndicator-r12*. E-UTRAN should ensure *syncOffsetIndicator* is set to the same value as *syncOffsetIndicator1* in *v2x-CommPreconfigSync* within *SL-V2X-Preconfiguration*, if configured. E-UTRAN should ensure *syncOffsetIndicator2* is set to the same value as *syncOffsetIndicator2* in *v2x-CommPreconfigSync* within *SL-V2X-Preconfiguration*, if configured. E-UTRAN should ensure *syncOffsetIndicator3* is set to the same value as *syncOffsetIndicator3* in *v2x-CommPreconfigSync* within *SL-V2X-Preconfiguration*, if configured. E-UTRAN should ensure all values in *syncOffsetIndicator* are same across all carrier frequencies configured for UEs performing V2X sidelink communication on multiple carrier frequencies. For *SL-V2X-Preconfiguration*, all values in *syncOffsetIndicator* should be same across all carrier frequencies configured for UEs performing V2X sidelink communication on multiple carrier frequencies. |
| ***syncTxPeriodic***  Indicates whether in each discovery period in which UE transmits discovery, the UE transmits SLSS once or periodically (i.e. every 40ms). In the latter case (periodic) the UE also transmits the *MasterInformationBlock-SL* message alongside. E-UTRAN configures this field only for synchronisation configurations applicable for PS discovery. |
| ***syncTxThreshIC***  Indicates the threshold used while in coverage. In case the RSRP measurement of the cell chosen for transmission of sidelink communication/ discovery announcements/ V2X sidelink communication, or of the cell used as reference for DL measurements and synchronization, is below the level indicated by this field, the UE may transmit SLSS (i.e. become synchronisation reference) when performing the corresponding sidelink transmission.. |
| ***txParameters***  Includes parameters relevant only for transmission. E-UTRAN includes the field in one entry per list, as included in *commSyncConfig* or *discSyncConfig*. |

#### – *SL-TF-ResourceConfig*

The IE *SL-TF-ResourceConfig* specifies a set of time/ frequency resources used for sidelink.

*SL-TF-ResourceConfig* information element

-- ASN1START

SL-TF-ResourceConfig-r12 ::= SEQUENCE {

prb-Num-r12 INTEGER (1..100),

prb-Start-r12 INTEGER (0..99),

prb-End-r12 INTEGER (0..99),

offsetIndicator-r12 SL-OffsetIndicator-r12,

subframeBitmap-r12 SubframeBitmapSL-r12

}

SubframeBitmapSL-r12 ::= CHOICE {

bs4-r12 BIT STRING (SIZE (4)),

bs8-r12 BIT STRING (SIZE (8)),

bs12-r12 BIT STRING (SIZE (12)),

bs16-r12 BIT STRING (SIZE (16)),

bs30-r12 BIT STRING (SIZE (30)),

bs40-r12 BIT STRING (SIZE (40)),

bs42-r12 BIT STRING (SIZE (42))

}

SubframeBitmapSL-r14 ::= CHOICE {

bs10-r14 BIT STRING (SIZE (10)),

bs16-r14 BIT STRING (SIZE (16)),

bs20-r14 BIT STRING (SIZE (20)),

bs30-r14 BIT STRING (SIZE (30)),

bs40-r14 BIT STRING (SIZE (40)),

bs50-r14 BIT STRING (SIZE (50)),

bs60-r14 BIT STRING (SIZE (60)),

bs100-r14 BIT STRING (SIZE (100))

}

-- ASN1STOP

| *SL-TF-ResourceConfig* field descriptions |
| --- |
| ***prb-Start, prb-End, prb-Num***  Sidelink transmissions on a sub-frame can occur on PRB with index greater than or equal to *prb-Start* and less than *prb-Start* + *prb-Num*, and on PRB with index greater than *prb-End* - *prb-Num* and less than or equal to *prb-End*. Even for neighbouring cells, *prb-Start* and *prb-End* are relative to PRB #0 of the cell from which it was obtained. See TS 36.213 [23], clauses 14.1.3, 14.2.3 and 14.3.3. |
| ***subframeBitmap***  Indicates the subframe bitmap indicating resources used for sidelink. For sidelink communication, E-UTRAN configures value *bs40* for FDD and the following values for TDD: value *bs42* for configuration0, value *bs16* for configuration1, value bs8 for configuration2, value *bs12* for configuration3, value *bs8* for configuration4, value *bs4* for configuration5 and value *bs30* for configuration6. For V2X sidelink communication, E-UTRAN configures value *bs16*, *bs20* or *bs100* for FDD or Frame Structure Type 1 as defined in TS 36.211 [21],and the following values for TDD or Frame Structure Type 2 as defined in TS 36.211 [21]: value *bs60* for configuration0, value *bs40* for configuration1, value bs20 for configuration2, value *bs30* for configuration3, value *bs20* for configuration4, value *bs10* for configuration5 and value *bs50* for configuration6. |

#### – *SL-TxPower*

The IE *SL-TxPower* is used to limit the UE's sidelink transmission power on a carrier frequency. The unit is dBm. Value minusinfinity corresponds to –infinity.

*SL-TxPower* information element

-- ASN1START

SL-TxPower-r14 ::= CHOICE {

minusinfinity-r14 NULL,

txPower-r14 INTEGER (-41..31)

}

-- ASN1STOP

#### – *SL-TypeTxSync*

The IE *SL-TypeTxSync* indicates the synchronization reference type.

*SL-TypeTxSync* information element

-- ASN1START

SL-TypeTxSync-r14 ::= ENUMERATED {gnss, enb, ue}

-- ASN1STOP

#### – *SL-ThresPSSCH-RSRP-List*

IE *SL-ThresPSSCH-RSRP-List* indicates a threshold used for sensing based UE autonomous resource selection (see TS 36.213 [23]). A resource is excluded if it is indicated or reserved by a decoded SCI and PSSCH RSRP in the associated data resource is above the threshold defined by IE *SL-ThresPSSCH-RSRP-List*.

*SL-ThresPSSCH-RSRP-List* information element

-- ASN1START

SL-ThresPSSCH-RSRP-List-r14 ::= SEQUENCE (SIZE (64)) OF SL-ThresPSSCH-RSRP-r14

SL-ThresPSSCH-RSRP-r14 ::= INTEGER (0..66)

-- ASN1STOP

| *SL-ThresPSSCH-RSRP-List* field descriptions |
| --- |
| ***SL-ThresPSSCH-RSRP***  Value 0 corresponds to minus infinity dBm, value 1 corresponds to -128dBm, value 2 corresponds to -126dBm, value n corresponds to (-128 + (n-1)\*2) dBm and so on, value 66 corresponds to infinity dBm. |

#### – *SL-TxParameters*

The IE *SL-TxParameters* identifies a set of parameters configured for sidelink transmission, used for communication, discovery and synchronisation.

*SL-TxParameters* information element

-- ASN1START

SL-TxParameters-r12 ::= SEQUENCE {

alpha-r12 Alpha-r12,

p0-r12 P0-SL-r12

}

P0-SL-r12 ::= INTEGER (-126..31)

-- ASN1STOP

| *SL-TxParameters* field descriptions |
| --- |
| ***alpha***  Parameter(s): ,,,,,,, See TS 36.213 [23], clauses 14.1.1.5, 14.2.1.3, 14.3.1 and 14.4, where 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. This field applies for sidelink power control. |
| ***p0***  Parameter: ,,,,,,, see TS 36.213 [23], clauses 14.1.1.5, 14.2.1.3, 14.3.1 and 14.4, unit dBm. |

#### – *SL-TxPoolIdentity*

The IE *SL-TxPoolIdentity* identifies an individual pool entry configured for sidelink transmission, used for communication and discovery.

*SL-TxPoolIdentity* information element

-- ASN1START

SL-TxPoolIdentity-r12 ::= INTEGER (1.. maxSL-TxPool-r12)

SL-TxPoolIdentity-v1310 ::= INTEGER (maxSL-TxPool-r12Plus1-r13.. maxSL-TxPool-r13)

SL-V2X-TxPoolIdentity-r14 ::= INTEGER (1.. maxSL-V2X-TxPool-r14)

-- ASN1STOP

#### – *SL-TxPoolToReleaseList*

The IE *SL-TxPoolToReleaseList* is used to release one or more individual pool entries used for sidelink transmission, for communication and discovery.

*SL-TxPoolToReleaseList* information element

-- ASN1START

SL-TxPoolToReleaseList-r12 ::= SEQUENCE (SIZE (1..maxSL-TxPool-r12)) OF SL-TxPoolIdentity-r12

SL-TxPoolToReleaseListExt-r13 ::= SEQUENCE (SIZE (1..maxSL-TxPool-v1310)) OF SL-TxPoolIdentity-v1310

-- ASN1STOP

#### – *SL-V2X-ConfigDedicated*

The IE *SL-V2X-ConfigDedicated* specifies the dedicated configuration information for V2X sidelink communication.

*SL-V2X-ConfigDedicated* information element

-- ASN1START

SL-V2X-ConfigDedicated-r14 ::= SEQUENCE {

commTxResources-r14 CHOICE {

release NULL,

setup CHOICE {

scheduled-r14 SEQUENCE {

sl-V-RNTI-r14 C-RNTI,

mac-MainConfig-r14 MAC-MainConfigSL-r12,

v2x-SchedulingPool-r14 SL-CommResourcePoolV2X-r14 OPTIONAL, -- Need ON

mcs-r14 INTEGER (0..31) OPTIONAL, -- Need OR

logicalChGroupInfoList-r14 LogicalChGroupInfoList-r13

},

ue-Selected-r14 SEQUENCE {

-- Pool for normal usage

v2x-CommTxPoolNormalDedicated-r14 SEQUENCE {

poolToReleaseList-r14 SL-TxPoolToReleaseListV2X-r14 OPTIONAL, -- Need ON

poolToAddModList-r14 SL-TxPoolToAddModListV2X-r14 OPTIONAL, -- Need ON

v2x-CommTxPoolSensingConfig-r14 SL-CommTxPoolSensingConfig-r14

OPTIONAL -- Need ON

}

}

}

} OPTIONAL, -- Need ON

v2x-InterFreqInfoList-r14 SL-InterFreqInfoListV2X-r14 OPTIONAL, -- Need ON

thresSL-TxPrioritization-r14 SL-Priority-r13 OPTIONAL, -- Need OR

typeTxSync-r14 SL-TypeTxSync-r14 OPTIONAL, -- Need OR

cbr-DedicatedTxConfigList-r14 SL-CBR-CommonTxConfigList-r14 OPTIONAL, -- Need OR

...,

[[ commTxResources-v1530 CHOICE {

release NULL,

setup CHOICE {

scheduled-v1530 SEQUENCE {

logicalChGroupInfoList-v1530 LogicalChGroupInfoList-v1530 OPTIONAL, -- Need OR

mcs-r15 INTEGER (0..31) OPTIONAL -- Need OR

},

ue-Selected-v1530 SEQUENCE {

v2x-FreqSelectionConfigList-r15 SL-V2X-FreqSelectionConfigList-r15 OPTIONAL --Need OR

}

}

} OPTIONAL, -- Need ON

v2x-PacketDuplicationConfig-r15 SL-V2X-PacketDuplicationConfig-r15 OPTIONAL, -- Need OR

syncFreqList-r15 SL-V2X-SyncFreqList-r15 OPTIONAL, -- Need OR

slss-TxMultiFreq-r15 ENUMERATED {true} OPTIONAL -- Need OR

]],

[[

slss-TxDisabled-r15 ENUMERATED {true} OPTIONAL -- Need OR

]]

}

LogicalChGroupInfoList-v1530 ::= SEQUENCE (SIZE (1..maxLCG-r13)) OF SL-ReliabilityList-r15

SL-TxPoolToAddModListV2X-r14 ::= SEQUENCE (SIZE (1.. maxSL-V2X-TxPool-r14)) OF SL-TxPoolToAddMod-r14

SL-TxPoolToAddMod-r14 ::= SEQUENCE {

poolIdentity-r14 SL-V2X-TxPoolIdentity-r14,

pool-r14 SL-CommResourcePoolV2X-r14

}

SL-TxPoolToReleaseListV2X-r14 ::= SEQUENCE (SIZE (1.. maxSL-V2X-TxPool-r14)) OF SL-V2X-TxPoolIdentity-r14

-- ASN1STOP

| *SL-V2X-ConfigDedicated* field descriptions |
| --- |
| ***cbr-DedicatedTxConfigList***  Indicates the dedicated list of CBR range division and the list of PSCCH TX configurations available to configure congestion control to the UE for V2X sidelink communication. |
| ***logicalChGroupInfoList***  Indicates for each logical channel group the list of associated priorities and reliabilities, used as specified in TS 36.321 [6], in order of increasing logical channel group identity. If E-UTRAN includes *logicalChGroupInfoList-v1530*, it includes the same number of entries, and listed in the same order, as in*logicalChGroupInfoList–r14*, anda logical channel group identity of the same entry in *logicalChGroupInfoList-r14* and in *logicalChGroupInfo-v1530* is associated with both the priorties (as in *logicalChGroupInfoList-r14)* and reliablities (as in *logicalChGroupInfoList-v1530)* of that entry. If *logicalChGroupInfoList-v1530* is not included, this field indicates for each logical channel group the list of associated priorities. |
| ***mcs***  Indicates the MCS as defined in TS 36.213 [23], clause 14.2.1. If not configured, the selection of MCS is up to UE implementation. If included, *mcs-r14* corresponds to the MCS table in Table 8.6.1-1 with 64QAM indices overridden by 16QAM used for transmission on PSSCH. If included, *mcs-r15* corresponds to both the MCS table in Table 8.6.1-1 in TS 36.213 [23] and the MCS table supporting 64QAM in Table 14.1.1-2 in TS 36.213 [23] used for transmission on PSSCH. If this field is present, E-UTRAN shall configure both *mcs-r14* and *mcs-r15*. |
| ***scheduled***  Indicates the configuration for the case E-UTRAN schedules the transmission resources based on sidelink specific BSR from the UE. |
| ***sl-V-RNTI***  Indicates the RNTI used for DCI dynamically scheduling sidelink resources for V2X sidelink communication. |
| ***slss-TxDisabled***  Value TRUE indicates that the primary carrier, even though equipped with synchronisation resources, cannot be used as a synchronisation carrier frequency to transmit SLSS or PSBCH. |
| ***thresSL-TxPrioritization***  Indicates the threshold used to determine whether SL V2X transmission is prioritized over uplink transmission if they overlap in time (see TS 36.321 [6]). This value shall overwrite *thresSL-TxPrioritization* configured in *SIB21* or *SL-V2X-Preconfiguration* if any. |
| ***typeTxSync***  Indicates the prioritized synchronization type (i.e. eNB or GNSS) for performing V2X sidelink communication on PCell. |
| ***ue-Selected***  Indicates the configuration for the case the UE selects the transmission resources from a pool of resources configured by E-UTRAN. |
| ***v2x-InterFreqInfoList***  Indicates synchronization and resource allocation configurations of other carrier frequencies than the serving carrier frequency for V2X sidelink communication. For inter-carrier scheduled resource allocation, CIF=1 in DCI-5A corresponds to the first entry in this frequency list, CIF=2 corresponds to the second entry, and so on (see TS 36.213 [23]). CIF=0 in DCI-5A corresponds to the frequency where the DCI is received. |
| ***v2x-SchedulingPool***  Indicates a pool of resources when E-UTRAN schedules Tx resources for V2X sidelink communications. |

#### – *SL-V2X-FreqSelectionConfigList*

The IE *SL-V2X-FreqSelectionConfigList* specifies the configuration information for carrier selection for V2X sidelink communication transmission using UE autonomous resource selection.

*SL-V2X-FreqSelectionConfigList* information element

-- ASN1START

SL-V2X-FreqSelectionConfigList-r15 ::= SEQUENCE (SIZE (1..8)) OF SL-V2X-FreqSelectionConfig-r15

SL-V2X-FreqSelectionConfig-r15 ::= SEQUENCE {

priorityList-r15 SL-PriorityList-r13,

threshCBR-FreqReselection-r15 SL-CBR-r14 OPTIONAL, -- Need OR

threshCBR-FreqKeeping-r15 SL-CBR-r14 OPTIONAL -- Need OR

}

-- ASN1STOP

| SL-V2X-FreqSelectionConfig field descriptions |
| --- |
| ***priorityList***  Indicates the list of PPPP(s) which is associated with the configurations in *threshCBR-FreqReselection* and in *threshCBR-FreqKeeping*. |
| ***threshCBR-FreqReselection***  Indicates the CBR threshold to determine whether the carrier frequency can be (re)selected for the transmission of V2X sidelink communication. See TS 36.321 [6]. |
| ***threshCBR-FreqKeeping***  Indicates the CBR threshold to determine whether the UE can keep using the carrier which was selected for the transmission of V2X sidelink communication. See TS 36.321 [6]. |

#### – *SL-V2X-PacketDuplicationConfig*

The IE *SL-V2X-PacketDuplicationConfig* specifies the configuration information for sidelink packet duplication for V2X sidelink communication transmission.

*SL-V2X-PacketDuplicationConfig* information element

-- ASN1START

SL-V2X-PacketDuplicationConfig-r15 ::= SEQUENCE {

threshSL-Reliability-r15 SL-Reliability-r15,

allowedCarrierFreqConfig-r15 SL-PPPR-Dest-CarrierFreqList-r15 OPTIONAL, -- Need OR

...

}

SL-PPPR-Dest-CarrierFreqList-r15 ::= SEQUENCE (SIZE (1..maxSL-Dest-r12)) OF SL-PPPR-Dest-CarrierFreq

SL-PPPR-Dest-CarrierFreq ::= SEQUENCE {

destinationInfoList-r15 SL-DestinationInfoList-r12 OPTIONAL, -- Need OR

allowedCarrierFreqList-r15 SL-AllowedCarrierFreqList-r15 OPTIONAL -- Need OR

}

SL-AllowedCarrierFreqList-r15 ::= SEQUENCE {

allowedCarrierFreqSet1 SEQUENCE (SIZE (1..maxFreqV2X-r14)) OF ARFCN-ValueEUTRA-r9,

allowedCarrierFreqSet2 SEQUENCE (SIZE (1..maxFreqV2X-r14)) OF ARFCN-ValueEUTRA-r9

}

-- ASN1STOP

| SL-V2X-PacketDuplicationConfig field descriptions |
| --- |
| ***allowedCarrierFreqList, allowedCarrierFreqSet1, allowedCarrierFreqSet2***  Indicates, for V2X sidelink communication, the set of carrier frequencies applicable for the transmission of the MAC SDUs from the sidelink logical channels whose associated destination are included in *destinationInfoList* (see TS 36.321 [6]). If present, E-UTRAN shall ensure *allowedCarrierFreqSet1* and *allowedCarrierFreqSet2* do not include the same carrier frequency. |
| ***threshSL-Reliability***  Indicates the reliability threshold used to determine whether sidelinik packet duplication is configured and activated for V2X sidelink communication transmission. See TS 36.323 [8] and TS 36.321 [6]. |

#### – *SL-V2X-SyncFreqList*

The IE *SL-V2X-SyncFreqList* specifies the list of candidate synchronisation carrier frequencies used for V2X sidelink communication.

*SL-V2X-SyncFreqList* information element

-- ASN1START

SL-V2X-SyncFreqList-r15 ::= SEQUENCE (SIZE (1..maxFreqV2X-r14)) OF ARFCN-ValueEUTRA-r9

-- ASN1STOP

#### – *SL-ZoneConfig*

The IE *SL-ZoneConfig* indicates zone configurations used for V2X sidelink communication.

*SL-ZoneConfig* information element

-- ASN1START

SL-ZoneConfig-r14 ::= SEQUENCE {

zoneLength-r14 ENUMERATED { m5, m10, m20, m50, m100, m200, m500, spare1},

zoneWidth-r14 ENUMERATED { m5, m10, m20, m50, m100, m200, m500, spare1},

zoneIdLongiMod-r14 INTEGER (1..4),

zoneIdLatiMod-r14 INTEGER (1..4)

}

-- ASN1STOP

| *SL-ZoneConfig* field descriptions |
| --- |
| ***zoneLength***  Indicates the length of each geographic zone. Value m5 corresponds to 5 meters, m10 corresponds to 10 meters and so on. |
| ***zoneWidth***  Indicates the width of each geographic zone. Value m5 corresponds to 5 meters, m10 corresponds to 10 meters and so on. |
| ***zoneIdLongiMod***  Indicates the total number of zones that is configured with respect to longitude. |
| ***zoneIdLatiMod***  Indicates the total number of zones that is configured with respect to latitude. |

## 6.4 RRC multiplicity and type constraint values

### – Multiplicity and type constraint definitions

-- ASN1START

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

maxBandCombSidelinkNR-r16 INTEGER ::= 512 -- Maximum number of NR sidelink band combinations

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

maxBandsENDC-r16 INTEGER ::= 10 -- Maximum number of NR bands from across all the PLMNs

-- sharing the serving cell in EN-DC for the forwarding

-- of *upperLayerIndication*.

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

maxCDMA-BandClass INTEGER ::= 32 -- Maximum value of the CDMA band classes

maxCE-Level-r13 INTEGER ::= 4 -- Maximum number of CE levels

maxExcludedCell INTEGER ::= 16 -- Maximum number of exclude-listed 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

maxCellNR-r17 INTEGER ::= 8 -- Maximum number of NR cells

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

maxCellAllowedNR-r16 INTEGER ::= 16 -- Maximum number of allowlisted NR cells in SIB24

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)

maxFreq INTEGER ::= 8 -- Maximum number of carrier frequencies

maxFreq-1-r16 INTEGER ::= 7 -- 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

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

maxIdleMeasCarriersExt-r16 INTEGER ::= 5 --Additional number of neighbouring inter-

-- frequency carriers measured in RRC\_IDLE and RRC\_INACTIVE

maxIdleMeasCarriers-r16 INTEGER ::= 8 -- Maximum number of neighbouring inter-

-- frequency/inter-RAT 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

maxSat-r17 INTEGER ::= 4 -- Maximum number of satellites

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-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.

maxTAC-r17 INTEGER ::= 12 -- Maximum number of Tracking Area Codes

-- broadcast in a cell

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.

### – End of EUTRA-RRC-Definitions

-- ASN1START

END

-- ASN1STOP

## 6.7 NB-IoT RRC messages

### 6.7.1 General NB-IoT message structure

-- ASN1START

NBIOT-RRC-Definitions DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS

RRCConnectionReestablishmentReject,

SecurityModeCommand,

SecurityModeComplete,

SecurityModeFailure,

AdditionalSpectrumEmission,

ARFCN-ValueEUTRA-r9,

CarrierFreqsGERAN,

CellGlobalIdEUTRA,

CellIdentity,

C-RNTI,

DedicatedInfoNAS,

DRB-Identity,

GNSS-ValidityDuration-r17,

InitialUE-Identity,

IntraFreqExcludedCellList,

IntraFreqNeighCellList,

I-RNTI-r15,

LocationInfo-r10,

maxAccessCat-1-r15,

maxBands,

maxExcludedCell,

maxCellInter,

maxCellIntra,

maxFBI2,

maxFreq,

maxMultiBands,

maxNrofS-NSSAI-r15,

maxPageRec,

maxPLMN-r11,

maxSAI-MBMS-r11,

maxSIB,

maxSIB-1,

MBMS-SAI-r11,

MBMS-SAI-List-r11,

MBMSSessionInfo-r13,

NextHopChainingCount,

NG-5G-S-TMSI-r15,

PagingUE-Identity,

PLMN-Identity,

PLMN-IdentityList2,

P-Max,

PowerRampingParameters,

PreambleTransMax,

PhysCellId,

Q-OffsetRange,

Q-QualMin-r9,

Q-RxLevMin,

ReestabUE-Identity,

RegisteredAMF-r15,

RegisteredMME,

ReselectionThreshold,

ResumeIdentity-r13,

RRC-TransactionIdentifier,

RSRP-Range,

S-NSSAI-r15,

S-TMSI,

SatelliteInfoList-r17,

ServingSatelliteInfo-r17,

SetupRelease,

ShortMAC-I,

SystemInformationBlockType16-r11,

SystemInfoValueTagSI-r13,

T-Reordering,

T-ReorderingExt-r17,

TimeAlignmentTimer,

TimeSinceFailure-r11,

TimeOffsetUTC-r17,

TMGI-r9,

TrackingAreaCode,

TrackingAreaCode-5GC-r15,

UAC-AC1-SelectAssistInfo-r15,

DataInactivityTimer-r14

FROM EUTRA-RRC-Definitions;

-- ASN1STOP

#### – *BCCH-BCH-Message-NB*

The *BCCH-BCH-Message-NB* class is the set of RRC messages that may be sent from the E‑UTRAN to the UE via BCH on the BCCH logical channel in FDD.

-- ASN1START

BCCH-BCH-Message-NB ::= SEQUENCE {

message BCCH-BCH-MessageType-NB

}

BCCH-BCH-MessageType-NB::= MasterInformationBlock-NB

-- ASN1STOP

#### – *BCCH-BCH-Message-TDD-NB*

The *BCCH-BCH-Message-TDD-NB* class is the set of RRC messages that may be sent from the E‑UTRAN to the UE via BCH on the BCCH logical channel in TDD.

-- ASN1START

BCCH-BCH-Message-TDD-NB ::= SEQUENCE {

message BCCH-BCH-MessageType-TDD-NB-r15

}

BCCH-BCH-MessageType-TDD-NB-r15 ::= MasterInformationBlock-TDD-NB-r15

-- ASN1STOP

#### – *BCCH-DL-SCH-Message-NB*

The *BCCH-DL-SCH-Message-NB* class is the set of RRC messages that may be sent from the E‑UTRAN to the UE via DL‑SCH on the BCCH logical channel.

-- ASN1START

BCCH-DL-SCH-Message-NB ::= SEQUENCE {

message BCCH-DL-SCH-MessageType-NB

}

BCCH-DL-SCH-MessageType-NB ::= CHOICE {

c1 CHOICE {

systemInformation-r13 SystemInformation-NB,

systemInformationBlockType1-r13 SystemInformationBlockType1-NB

},

messageClassExtension SEQUENCE {}

}

-- ASN1STOP

#### – *PCCH-Message-NB*

The *PCCH-Message-NB* class is the set of RRC messages that may be sent from the E‑UTRAN to the UE on the PCCH logical channel.

-- ASN1START

PCCH-Message-NB ::= SEQUENCE {

message PCCH-MessageType-NB

}

PCCH-MessageType-NB ::= CHOICE {

c1 CHOICE {

paging-r13 Paging-NB

},

messageClassExtension SEQUENCE {}

}

-- ASN1STOP

#### – *DL-CCCH-Message-NB*

The *DL-CCCH-Message-NB* class is the set of RRC messages that may be sent from the E‑UTRAN to the UE on the downlink CCCH logical channel.

-- ASN1START

DL-CCCH-Message-NB ::= SEQUENCE {

message DL-CCCH-MessageType-NB

}

DL-CCCH-MessageType-NB ::= CHOICE {

c1 CHOICE {

rrcConnectionReestablishment-r13 RRCConnectionReestablishment-NB,

rrcConnectionReestablishmentReject-r13 RRCConnectionReestablishmentReject,

rrcConnectionReject-r13 RRCConnectionReject-NB,

rrcConnectionSetup-r13 RRCConnectionSetup-NB,

rrcEarlyDataComplete-r15 RRCEarlyDataComplete-NB-r15,

spare3 NULL, spare2 NULL, spare1 NULL

},

messageClassExtension SEQUENCE {}

}

-- ASN1STOP

#### – *DL-DCCH-Message-NB*

The *DL-DCCH-Message-NB* class is the set of RRC messages that may be sent from the E‑UTRAN to the UE on the downlink DCCH logical channel.

-- ASN1START

DL-DCCH-Message-NB ::= SEQUENCE {

message DL-DCCH-MessageType-NB

}

DL-DCCH-MessageType-NB ::= CHOICE {

c1 CHOICE {

dlInformationTransfer-r13 DLInformationTransfer-NB,

rrcConnectionReconfiguration-r13 RRCConnectionReconfiguration-NB,

rrcConnectionRelease-r13 RRCConnectionRelease-NB,

securityModeCommand-r13 SecurityModeCommand,

ueCapabilityEnquiry-r13 UECapabilityEnquiry-NB,

rrcConnectionResume-r13 RRCConnectionResume-NB,

ueInformationRequest-r16 UEInformationRequest-NB-r16,

spare1 NULL

},

messageClassExtension SEQUENCE {}

}

-- ASN1STOP

#### – *UL-CCCH-Message-NB*

The *UL-CCCH-Message-NB* class is the set of RRC messages that may be sent from the UE to the E‑UTRAN on the uplink CCCH logical channel.

-- ASN1START

UL-CCCH-Message-NB ::= SEQUENCE {

message UL-CCCH-MessageType-NB

}

UL-CCCH-MessageType-NB ::= CHOICE {

c1 CHOICE {

rrcConnectionReestablishmentRequest-r13 RRCConnectionReestablishmentRequest-NB,

rrcConnectionRequest-r13 RRCConnectionRequest-NB,

rrcConnectionResumeRequest-r13 RRCConnectionResumeRequest-NB,

rrcEarlyDataRequest-r15 RRCEarlyDataRequest-NB-r15

},

messageClassExtension SEQUENCE {}

}

-- ASN1STOP

#### – *SC-MCCH-Message-NB*

The *SC-MCCH-Message-NB* class is the set of RRC messages that may be sent from the E‑UTRAN to the NB-IoT UE on the SC-MCCH logical channel.

-- ASN1START

SC-MCCH-Message-NB ::= SEQUENCE {

message SC-MCCH-MessageType-NB

}

SC-MCCH-MessageType-NB ::= CHOICE {

c1 CHOICE {

scptmConfiguration-r14 SCPTMConfiguration-NB-r14

},

messageClassExtension SEQUENCE {}

}

-- ASN1STOP

#### – *UL-DCCH-Message-NB*

The *UL-DCCH-Message-NB* class is the set of RRC messages that may be sent from the UE to the E‑UTRAN on the uplink DCCH logical channel.

-- ASN1START

UL-DCCH-Message-NB ::= SEQUENCE {

message UL-DCCH-MessageType-NB

}

UL-DCCH-MessageType-NB ::= CHOICE {

c1 CHOICE {

rrcConnectionReconfigurationComplete-r13 RRCConnectionReconfigurationComplete-NB,

rrcConnectionReestablishmentComplete-r13 RRCConnectionReestablishmentComplete-NB,

rrcConnectionSetupComplete-r13 RRCConnectionSetupComplete-NB,

securityModeComplete-r13 SecurityModeComplete,

securityModeFailure-r13 SecurityModeFailure,

ueCapabilityInformation-r13 UECapabilityInformation-NB,

ulInformationTransfer-r13 ULInformationTransfer-NB,

rrcConnectionResumeComplete-r13 RRCConnectionResumeComplete-NB,

ueInformationResponse-r16 UEInformationResponse-NB-r16,

purConfigurationRequest-r16 PURConfigurationRequest-NB-r16,

spare6 NULL, spare5 NULL, spare4 NULL,

spare3 NULL, spare2 NULL, spare1 NULL

},

messageClassExtension SEQUENCE {}

}

-- ASN1STOP

### 6.7.2 NB-IoT Message definitions

#### – *DLInformationTransfer-NB*

The *DLInformationTransfer-NB* message is used for the downlink transfer of NAS dedicated information.

Signalling radio bearer: SRB1or SRB1bis

RLC-SAP: AM

Logical channel: DCCH

Direction: E‑UTRAN to UE

*DLInformationTransfer-NB* message

-- ASN1START

DLInformationTransfer-NB ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

c1 CHOICE {

dlInformationTransfer-r13 DLInformationTransfer-NB-r13-IEs,

spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

DLInformationTransfer-NB-r13-IEs ::= SEQUENCE {

dedicatedInfoNAS-r13 DedicatedInfoNAS,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

#### – *MasterInformationBlock-NB*

The *MasterInformationBlock-NB* includes the system information transmitted on BCH in FDD.

Signalling radio bearer: N/A

RLC-SAP: TM

Logical channel: BCCH

Direction: E‑UTRAN to UE

*MasterInformationBlock-NB*

-- ASN1START

MasterInformationBlock-NB ::= SEQUENCE {

systemFrameNumber-MSB-r13 BIT STRING (SIZE (4)),

hyperSFN-LSB-r13 BIT STRING (SIZE (2)),

schedulingInfoSIB1-r13 INTEGER (0..15),

systemInfoValueTag-r13 INTEGER (0..31),

ab-Enabled-r13 BOOLEAN,

operationModeInfo-r13 CHOICE {

inband-SamePCI-r13 Inband-SamePCI-NB-r13,

inband-DifferentPCI-r13 Inband-DifferentPCI-NB-r13,

guardband-r13 Guardband-NB-r13,

standalone-r13 Standalone-NB-r13

},

additionalTransmissionSIB1-r15 BOOLEAN,

ab-Enabled-5GC-r16 BOOLEAN,

partEARFCN-17 CHOICE {

spare BIT STRING (SIZE (2)),

earfcn-LSB BIT STRING (SIZE (2))

},

spare BIT STRING (SIZE (6))

}

Guardband-NB-r13 ::= SEQUENCE {

rasterOffset-r13 ChannelRasterOffset-NB-r13,

spare BIT STRING (SIZE (3))

}

Inband-SamePCI-NB-r13 ::= SEQUENCE {

eutra-CRS-SequenceInfo-r13 INTEGER (0..31)

}

Inband-DifferentPCI-NB-r13 ::= SEQUENCE {

eutra-NumCRS-Ports-r13 ENUMERATED {same, four},

rasterOffset-r13 ChannelRasterOffset-NB-r13,

spare BIT STRING (SIZE (2))

}

Standalone-NB-r13 ::= SEQUENCE {

spare BIT STRING (SIZE (5))

}

-- ASN1STOP

| *MasterInformationBlock-NB* field descriptions |
| --- |
| ***ab-Enabled***  Value TRUE indicates that access barring is enabled for UEs connected to EPC. |
| ***ab-Enabled-5GC***  Value TRUE indicates that access barring is enabled for UEs connected to 5GC. |
| ***additionalTransmissionSIB1***  Value TRUE indicates that additional SIB1-NB transmissions are present. See TS 36.211 [21] and TS 36.213 [23].  E-UTRAN only configures *additionalTransmissionSIB1* to *TRUE* if *schedulingInfoSIB1* indicates that the number of NPDSCH repetitions is 16, see TS 36.213 [23], Table 16.4.1.3-3. |
| ***earfcn-LSB***  Indicates the 2 least significant bits of the EARFCN for NTN bands where 100 kHz raster is used, see TS 36.101 [42]. |
| ***eutra-CRS-SequenceInfo***  Information of the carrier containing NPSS/NSSS/NPBCH.  Each value is associated with an E-UTRA PRB index as an offset from the middle of the LTE system sorted out by channel raster offset. See TS 36.211[21] and TS 36.213 [23]. |
| ***eutra-NumCRS-Ports***  Number of E-UTRA CRS antenna ports, either the same number of ports as NRS or 4 antenna ports. See TS 36.211 [21], TS 36.212 [22], and TS 36.213 [23]. |
| ***hyperSFN-LSB***  Indicates the 2 least significant bits of hyper SFN. The remaining bits are present in *SystemInformationBlockType1-NB.* |
| ***operationModeInfo***  Deployment scenario (in-band/guard-band/standalone) and related information. See TS 36.211 [21] and TS 36.213 [23].  *Inband-SamePCI* indicates an in-band deployment and that the NB-IoT and LTE cell share the same physical cell id and have the same number of NRS and CRS ports.  *Inband-DifferentPCI* indicates an in-band deployment and that the NB-IoT and LTE cell have different physical cell id.  *guardband* indicatesa guard-band deployment.  *standalone* indicates a standalone deployment. |
| ***schedulingInfoSIB1***  This field contains an index to a table specified in TS 36.213 [23], Table 16.4.1.3-3, that defines *SystemInformationBlockType1-NB* scheduling information. |
| ***systemFrameNumber-MSB***  Defines the 4 most significant bits of the SFN. As indicated in TS 36.211 [21], the 6 least significant bits of the SFN are acquired implicitly by decoding the NPBCH. |
| ***systemInfoValueTag***  Common for all SIBs other than MIB-NB, SIB14-NB, SIB16-NB and SIB31-NB. |

#### *– MasterInformationBlock-TDD-NB*

The *MasterInformationBlock-TDD-NB* includes the system information transmitted on BCH in TDD.

Signalling radio bearer: N/A

RLC-SAP: TM

Logical channel: BCCH

Direction: E‑UTRAN to UE

*MasterInformationBlock-TDD-NB*

-- ASN1START

MasterInformationBlock-TDD-NB-r15 ::= SEQUENCE {

systemFrameNumber-MSB-r15 BIT STRING (SIZE (4)),

hyperSFN-LSB-r15 BIT STRING (SIZE (2)),

schedulingInfoSIB1-r15 INTEGER (0..15),

systemInfoValueTag-r15 INTEGER (0..31),

ab-Enabled-r15 BOOLEAN,

operationModeInfo-r15 CHOICE {

inband-SamePCI-r15 Inband-SamePCI-TDD-NB-r15,

inband-DifferentPCI-r15 Inband-DifferentPCI-TDD-NB-r15,

guardband-r15 GuardbandTDD-NB-r15,

standalone-r15 StandaloneTDD-NB-r15

},

sib1-CarrierInfo-r15 ENUMERATED {anchor, non-anchor},

ab-Enabled-5GC-r16 BOOLEAN,

spare BIT STRING (SIZE (8))

}

GuardbandTDD-NB-r15 ::= SEQUENCE {

rasterOffset-r15 ChannelRasterOffset-NB-r13,

sib-GuardbandInfo-r15 CHOICE {

sib-GuardbandAnchor-r15 SIB-GuardbandAnchorTDD-NB-r15,

sib-GuardbandGuardband-r15 SIB-GuardbandGuardbandTDD-NB-r15,

sib-GuardbandInbandSamePCI-r15 SIB-GuardbandInbandSamePCI-TDD-NB-r15,

sib-GuardbandinbandDiffPCI-r15 SIB-GuardbandInbandDiffPCI-TDD-NB-r15

},

eutra-Bandwitdh-r15 ENUMERATED {bw5or10, bw15or20}

}

Inband-SamePCI-TDD-NB-r15 ::= SEQUENCE {

eutra-CRS-SequenceInfo-r15 INTEGER (0..31),

sib-InbandLocation-r15 ENUMERATED {lower, higher}

}

Inband-DifferentPCI-TDD-NB-r15 ::= SEQUENCE {

eutra-NumCRS-Ports-r15 ENUMERATED {same, four},

rasterOffset-r15 ChannelRasterOffset-NB-r13,

sib-InbandLocation-r15 ENUMERATED {lower, higher},

spare BIT STRING (SIZE (2))

}

StandaloneTDD-NB-r15 ::= SEQUENCE {

sib-StandaloneLocation-r15 ENUMERATED {lower, higher},

spare BIT STRING (SIZE (5))

}

SIB-GuardbandAnchorTDD-NB-r15 ::= SEQUENCE {

spare BIT STRING (SIZE (1))

}

SIB-GuardbandGuardbandTDD-NB-r15 ::= SEQUENCE {

sib-GuardbandGuardbandLocation-r15 ENUMERATED {same, opposite}

}

SIB-GuardbandInbandSamePCI-TDD-NB-r15 ::= SEQUENCE {

spare BIT STRING (SIZE (1))

}

SIB-GuardbandInbandDiffPCI-TDD-NB-r15 ::= SEQUENCE {

sib-EUTRA-NumCRS-Ports-r15 ENUMERATED {same, four}

}

-- ASN1STOP

| ***MasterInformationBlock-TDD-NB* field descriptions** |
| --- |
| ***ab-Enabled***  Value TRUE indicates that access barring is enabled for UEs connected to EPC. |
| ***ab-Enabled-5GC***  Value TRUE indicates that access barring is enabled for UEs connected to 5GC. |
| ***eutra-Bandwidth***  EUTRA system bandwidth. Value *bw5or10* corresponds to bandwidth 5 or 10 MHz, value *bw15or20* corresponds to bandwidth 15 or 20 MHz.  If the value of *eutra-Bandwidth* is *bw5or10* and *rasterOffset* is set to *khz7dot5*or *khz-7dot5*, the E-UTRA system bandwidth is 5 MHz.  If the value of *eutra-Bandwidth* is *bw5or10* and *rasterOffset* is set to *khz2dot5* or *khz-2dot5*, the E-UTRA system bandwidth is 10 MHz.  If the value of *eutra-Bandwidth* is *bw15or20* and *rasterOffset* is set to *khz7dot5* or *khz-7dot5*, the E-UTRA system bandwidth is 15 MHz.  If the value of *eutra-Bandwidth* is *bw15or20* and *rasterOffset* is set to *khz2dot5* or *khz-2dot5*, the E-UTRA system bandwidth is 20 MHz.  When the E-UTRA system bandwidth is 5 MHz or 15 MHz, if the value of *sib-GuardbandInfo* is *sib-GuardbandInbandSamePCI* or *sib-GuardbandinbandDiffPCI*, the offset between the anchor carrier and the non-anchor carrier used for SIB1 and/or SI transmission is 45 kHz. |
| ***eutra-CRS-SequenceInfo***  Information of the carrier containing NPSS/NSSS/NPBCH.  Each value is associated with an E-UTRA PRB index as an offset from the middle of the LTE system sorted out by channel raster offset. See TS 36.211 [21] and TS 36.213 [23]. |
| ***eutra-NumCRS-Ports, sib-eutra-NumCRS-Ports***  Number of E-UTRA CRS antenna ports, either the same number of ports as NRS or 4 antenna ports. See TS 36.211 [21], TS 36.212 [22], and TS 36.213 [23]. |
| ***hyperSFN-LSB***  Indicates the 2 least significant bits of hyper SFN. The remaining bits are present in *SystemInformationBlockType1-NB.* |
| ***operationModeInfo***  Deployment scenario (in-band/guard-band/standalone) and related information. See TS 36.211 [21] and TS 36.213 [23].  *Inband-SamePCI* indicates an in-band deployment and that the NB-IoT and LTE cell share the same physical cell id and have the same number of NRS and CRS ports.  *Inband-DifferentPCI* indicates an in-band deployment and that the NB-IoT and LTE cell have different physical cell id.  *guardband* indicatesa guard-band deployment.  *standalone* indicates a standalone deployment.  When *operationmodeInfo* is set to *guardband,* if *rasterOffset* is set to *khz-7dot5* or *khz-2dot5,* the guardband anchor carrier is at the higher edge of the LTE carrier. If *rasterOffset* is set to *khz7dot5* or *khz2dot5*, the guardband anchor carrier is at the lower edge of the LTE carrier |
| ***schedulingInfoSIB1***  This field contains an index to a table specified in TS 36.213 [23], Table 16.4.1.3-5 or Table 16.4.1.3-7 when *sib1-CarrierInfo* is set to *anchor* or to *non-anchor* respectively, that defines *SystemInformationBlockType1-NB* scheduling information.  If *sib1-CarrierInfo* is set to non-anchor, E-UTRAN configures a value between 0 and 7. |
| ***sib-GuardbandGuardbandLocation***  Location of the non-anchor carrier used for SIB1 and/or SI transmission when *operationmodeInfo* is set to *guardband* and the non-anchor carrier is in guardband. See TS 36.213 [23].  Value *same* corresponds to the carrier adjacent to the anchor carrier on the outer side of the guardband, value *opposite* corresponds to the carrier closest to the edge of the LTE carrier in the opposite guardband. |
| ***sib-GuardbandInfo***  Information of the carrier used for SIB1 and/or SI transmission when *operationmodeInfo* is set to *guardband*. See TS 36.213 [23].  *sib-GuardbandAnchor* indicates the anchor carrier.  *sib-GuardbandGuardband* indicates a non-anchor carrier in guardband mode.  *sib-GuardbandInbandSamePCI* or *sib-GuardbandinbandDiffPCI* indicates a non-anchor carrier in inband mode, and at the edge of the LTE carrier and on the same side as the anchor carrier. |
| ***sib-InbandLocation***  Location of the non-anchor carrier used for SIB1 and/or SI transmission when *operationmodeInfo* is set to *inband-SamePCI* or *inband-DifferentPCI*,and *sib1-CarrierInfo* value and/or *tdd-SI-CarrierInfo* in SIB1-NB is set to *non-anchor*. See TS 36.213 [23].  Value *lower* corresponds to the lower adjacent carrier relative to the anchor carrier and value *higher* corresponds to the higher adjacent carrier relative to the anchor carrier.  If both *sib1-CarrierInfo* value and *tdd-SI-CarrierInfo* value in SIB1-NB are set to *anchor,* the UE ignores *sib-InbandLocation*. |
| ***sib-StandaloneLocation***  Location of the non-anchor carrier used for SIB1 and/or SI transmission when *operationmodeInfo* is set to *standalone*,and *sib1-CarrierInfo* value and/or *tdd-SI-CarrierInfo* in SIB1-NB is set to *non-anchor*. See TS 36.213 [23].  Value *lower* corresponds to the lower adjacent carrier relative to the anchor carrier and value *higher* corresponds to the higher adjacent carrier relative to the anchor carrier.  If both *sib1-CarrierInfo* value and *tdd-SI-CarrierInfo* value in SIB1-NB are set to *anchor,* the UE ignores *sib-StandaloneLocation*. |
| ***sib1-CarrierInfo***  Carrier used for SIB1 transmission. See TS 36.213 [23], clause 16.4.1.3. Value *anchor* corresponds to anchor carrier, value *non-anchor* corresponds to non-anchor carrier. |
| ***systemFrameNumber-MSB***  Defines the 4 most significant bits of the SFN. As indicated in TS 36.211 [21], the 6 least significant bits of the SFN are acquired implicitly by decoding the NPBCH. |
| ***systemInfoValueTag***  Common for all SIBs other than MIB-NB, SIB14-NB and SIB16-NB. |

#### – *Paging-NB*

The *Paging-NB* message is used for the notification of one or more UEs.

Signalling radio bearer: N/A

RLC-SAP: TM

Logical channel: PCCH

Direction: E‑UTRAN to UE

*Paging-NB* message

-- ASN1START

Paging-NB ::= SEQUENCE {

pagingRecordList-r13 PagingRecordList-NB-r13 OPTIONAL, -- Need ON

systemInfoModification-r13 ENUMERATED {true} OPTIONAL, -- Need ON

systemInfoModification-eDRX-r13 ENUMERATED {true} OPTIONAL, -- Need ON

nonCriticalExtension Paging-NB-v1610-IEs OPTIONAL

}

Paging-NB-v1610-IEs ::= SEQUENCE {

pagingRecordList-v1610 PagingRecordList-NB-v1610 OPTIONAL, -- Need ON

nonCriticalExtension SEQUENCE {} OPTIONAL

}

PagingRecordList-NB-r13 ::= SEQUENCE (SIZE (1..maxPageRec)) OF PagingRecord-NB-r13

PagingRecordList-NB-v1610 ::= SEQUENCE (SIZE (1..maxPageRec)) OF PagingRecord-NB-v1610

PagingRecord-NB-r13 ::= SEQUENCE {

ue-Identity-r13 PagingUE-Identity,

...

}

PagingRecord-NB-v1610 ::= SEQUENCE {

mt-EDT-r16 ENUMERATED {true} OPTIONAL -- Need ON

}

-- ASN1STOP

| *Paging-NB* field descriptions |
| --- |
| ***mt-EDT***  Indication of mobile-terminated EDT. |
| ***pagingRecordList***  If E-UTRAN includes *pagingRecordList-v1610*,it includes the same number of entries, and listed in the same order, as in *pagingRecordList* (i.e. without suffix). |
| ***systemInfoModification***  If present: indication of a BCCH modification other than for *SystemInformationBlockType14-NB* (SIB14-NB), *SystemInformationBlockType16-NB* (SIB16-NB) and *SystemInformationBlockType31-NB* (SIB31-NB). This indication does not apply to UEs using eDRX cycle longer than the BCCH modification period. |
| ***systemInfoModification-eDRX***  If present: indication of a BCCH modification other than for *SystemInformationBlockType14-NB* (SIB14-NB), *SystemInformationBlockType16-NB* (SIB16-NB) and *SystemInformationBlockType31-NB* (SIB31-NB). This indication applies only to UEs using eDRX cycle longer than the BCCH modification period. |
| ***ue-Identity***  Provides the NAS identity of the UE that is being paged. |

#### – *PURConfigurationRequest-NB*

The *PURConfigurationRequest-NB* message is used by the UE to transfer PUR related information to the E-UTRAN.

Signalling radio bearer: SRB1 or SRB1bis

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E-UTRAN

*PURConfigurationRequest-NB message*

-- ASN1START

PURConfigurationRequest-NB-r16 ::= SEQUENCE {

criticalExtensions CHOICE {

purConfigurationRequest-r16 PURConfigurationRequest-NB-r16-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

PURConfigurationRequest-NB-r16-IEs ::= SEQUENCE {

pur-ConfigRequest-r16 PUR-ConfigRequest-NB-r16 OPTIONAL,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

PUR-ConfigRequest-NB-r16 ::= CHOICE{

pur-ReleaseRequest NULL,

pur-SetupRequest SEQUENCE {

requestedNumOccasions-r16 ENUMERATED {one, infinite},

requestedPeriodicityAndOffset-r16 PUR-PeriodicityAndOffset-NB-r16,

requestedTBS-r16 ENUMERATED {b328, b376, b424, b472, b504, b552, b584,

b616, b680, b744, b776, b808, b872, b904,

b936, b968, b1000, b1032, b1096, b1128,

b1192, b1224, b1256, b1352, b1384, b1544,

b1608, b1736, b1800, b2024, b2280, b2536},

rrc-ACK-r16 ENUMERATED {true} OPTIONAL

}

}

-- ASN1STOP

| *PURConfigurationRequest-NB* field descriptions |
| --- |
| ***requestedNumOccasions***  Indicates the requested number of PUR occasions. Value *one* corresponds to one occasion and value *infinite* corresponds to infinite occasions. |
| ***requestedPeriodicityAndOffset***  Indicates the requested periodicity of the PUR occasions and time offset until the first PUR occasion. |
| ***requestedTBS***  Indicates the requested TBS. Value *b328* corresponds to 328 bits, value *b376* corresponds to 376 bits, and so on. |
| ***rrc-ACK***  Indicates RRC response message is prefered by the UE for acknowledging the reception of a transmission using PUR. |

#### – *RRCConnectionReconfiguration-NB*

The *RRCConnectionReconfiguration-NB* message is the command to modify an RRC connection. It may convey information for resource configuration (including RBs, MAC main configuration and physical channel configuration) including any associated dedicated NAS information.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: E‑UTRAN to UE

*RRCConnectionReconfiguration-NB* message

-- ASN1START

RRCConnectionReconfiguration-NB ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

c1 CHOICE{

rrcConnectionReconfiguration-r13 RRCConnectionReconfiguration-NB-r13-IEs,

spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

RRCConnectionReconfiguration-NB-r13-IEs ::= SEQUENCE {

dedicatedInfoNASList-r13 SEQUENCE (SIZE(1..maxDRB-NB-r13)) OF

DedicatedInfoNAS OPTIONAL, -- Need ON

radioResourceConfigDedicated-r13 RadioResourceConfigDedicated-NB-r13 OPTIONAL, -- Need ON

fullConfig-r13 ENUMERATED {true} OPTIONAL, -- Cond Reestab

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

| *RRCConnectionReconfiguration-NB* field descriptions |
| --- |
| ***dedicatedInfoNASList***  This field is used to transfer UE specific NAS layer information between the network and the UE. The RRC layer is transparent for each PDU in the list. |
| ***fullConfig***  Indicates the full configuration option is applicable for the RRC Connection Reconfiguration message. |

| Conditional presence | Explanation |
| --- | --- |
| *Reestab* | This field is optionally present, need ON upon the first reconfiguration after RRC connection re-establishment; otherwise the field is not present. |

#### – *RRCConnectionReconfigurationComplete-NB*

The *RRCConnectionReconfigurationComplete-NB* message is used to confirm the successful completion of an RRC connection reconfiguration.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E‑UTRAN

*RRCConnectionReconfigurationComplete-NB* message

-- ASN1START

RRCConnectionReconfigurationComplete-NB ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

rrcConnectionReconfigurationComplete-r13 RRCConnectionReconfigurationComplete-NB-r13-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

RRCConnectionReconfigurationComplete-NB-r13-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

#### – *RRCConnectionReestablishment-NB*

The *RRCConnectionReestablishment-NB* message is used to re-establish SRB1.

Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH

Direction: E‑UTRAN to UE

*RRCConnectionReestablishment-NB* message

-- ASN1START

RRCConnectionReestablishment-NB ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

c1 CHOICE{

rrcConnectionReestablishment-r13 RRCConnectionReestablishment-NB-r13-IEs,

spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

RRCConnectionReestablishment-NB-r13-IEs ::= SEQUENCE {

radioResourceConfigDedicated-r13 RadioResourceConfigDedicated-NB-r13,

nextHopChainingCount-r13 NextHopChainingCount,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension RRCConnectionReestablishment-NB-v1430-IEs OPTIONAL

}

RRCConnectionReestablishment-NB-v1430-IEs ::= SEQUENCE {

dl-NAS-MAC BIT STRING (SIZE (16)) OPTIONAL, -- Cond Reestablish-CP

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

| *RRCConnectionReestablishment-NB* field descriptions |
| --- |
| ***dl-NAS-MAC***  Downlink authentication token, see TS 33.401 [32]. If this field is present, the UE shall ignore the field *nextHopChainingCount*. |

| Conditional presence | Explanation |
| --- | --- |
| *Reestablish-CP* | This field is mandatory present for NB-IoT UE using the Control Plane CIoT EPS/5GS optimisation; otherwise the field is not present. |

#### – *RRCConnectionReestablishmentComplete-NB*

The *RRCConnectionReestablishmentComplete-NB* message is used to confirm the successful completion of an RRC connection re-establishment.

Signalling radio bearer: SRB1 or SRB1bis

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E‑UTRAN

*RRCConnectionReestablishmentComplete-NB* message

-- ASN1START

RRCConnectionReestablishmentComplete-NB ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

rrcConnectionReestablishmentComplete-r13 RRCConnectionReestablishmentComplete-NB-r13-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

RRCConnectionReestablishmentComplete-NB-r13-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension RRCConnectionReestablishmentComplete-NB-v1470-IEs OPTIONAL

}

RRCConnectionReestablishmentComplete-NB-v1470-IEs ::= SEQUENCE {

measResultServCell-r14 MeasResultServCell-NB-r14 OPTIONAL,

nonCriticalExtension RRCConnectionReestablishmentComplete-NB-v1610-IEs OPTIONAL

}

RRCConnectionReestablishmentComplete-NB-v1610-IEs ::= SEQUENCE {

rlf-InfoAvailable-r16 ENUMERATED {true} OPTIONAL,

anr-InfoAvailable-r16 ENUMERATED {true} OPTIONAL,

nonCriticalExtension RRCConnectionReestablishmentComplete-NB-v1710-IEs OPTIONAL

}

RRCConnectionReestablishmentComplete-NB-v1710-IEs ::= SEQUENCE {

gnss-ValidityDuration-r17 GNSS-ValidityDuration-r17 OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

| *RRCConnectionReestablishmentComplete-NB field descriptions* |
| --- |
| ***anr-InfoAvailable***  Indicates the availability of ANR measurement information. |
| ***measResultServCell***  This field refers to the last idle mode measurement results taken of the serving cell. |
| ***rlf-InfoAvailable***  Indicates the availability of radio link failure related information. |

#### – *RRCConnectionReestablishmentRequest-NB*

The *RRCConnectionReestablishmentRequest-NB* message is used to request the reestablishment of an RRC connection.

Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH

Direction: UE to E‑UTRAN

*RRCConnectionReestablishmentRequest-NB* message

-- ASN1START

RRCConnectionReestablishmentRequest-NB ::= SEQUENCE {

criticalExtensions CHOICE {

rrcConnectionReestablishmentRequest-r13

RRCConnectionReestablishmentRequest-NB-r13-IEs,

later CHOICE {

rrcConnectionReestablishmentRequest-r14

RRCConnectionReestablishmentRequest-NB-r14-IEs,

later CHOICE {

rrcConnectionReestablishmentRequest-r16

RRCConnectionReestablishmentRequest-5GC-NB-r16-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

}

}

RRCConnectionReestablishmentRequest-NB-r13-IEs ::= SEQUENCE {

ue-Identity-r13 ReestabUE-Identity,

reestablishmentCause-r13 ReestablishmentCause-NB-r13,

cqi-NPDCCH-r14 CQI-NPDCCH-NB-r14,

earlyContentionResolution-r14 BOOLEAN,

spare BIT STRING (SIZE (20))

}

RRCConnectionReestablishmentRequest-NB-r14-IEs ::= SEQUENCE {

ue-Identity-r14 ReestabUE-Identity-CP-NB-r14,

reestablishmentCause-r14 ReestablishmentCause-NB-r13,

cqi-NPDCCH-r14 CQI-NPDCCH-Short-NB-r14,

earlyContentionResolution-r14 BOOLEAN,

spare BIT STRING (SIZE (1))

}

RRCConnectionReestablishmentRequest-5GC-NB-r16-IEs ::= SEQUENCE {

ue-Identity-r16 ReestabUE-Identity-CP-5GC-NB-r16,

reestablishmentCause-r16 ReestablishmentCause-NB-r13,

cqi-NPDCCH-r16 CQI-NPDCCH-Short-NB-r14,

spare BIT STRING (SIZE (1))

}

ReestablishmentCause-NB-r13 ::= ENUMERATED {

reconfigurationFailure, otherFailure,

spare2, spare1}

ReestabUE-Identity-CP-NB-r14 ::= SEQUENCE {

s-TMSI-r14 S-TMSI,

ul-NAS-MAC-r14 BIT STRING (SIZE (16)),

ul-NAS-Count-r14 BIT STRING (SIZE (5))

}

ReestabUE-Identity-CP-5GC-NB-r16 ::= SEQUENCE {

truncated5G-S-TMSI-r16 BIT STRING (SIZE (40)),

ul-NAS-MAC-r16 BIT STRING (SIZE (16)),

ul-NAS-Count-r16 BIT STRING (SIZE (5))

}

-- ASN1STOP

| *RRCConnectionReestablishmentRequest-NB* field descriptions |
| --- |
| ***earlyContentionResolution***  Value TRUE indicates UE supports MAC PDU containing the UE contention resolution identity MAC control element without RRC response message. This field is always set to TRUE in this version of the specification. |
| ***reestablishmentCause***  Indicates the failure cause that triggered the re-establishment procedure.  eNB is not expected to reject a *RRCConnectionReestablishmentRequest* due to unknown cause value being used by the UE. |
| ***truncated5G-S-TMSI***  For description of this field see TS 23.003 [27]. |
| ***ue-Identity***  UE identity included to retrieve UE context and to facilitate contention resolution by lower layers. |
| ***ul-NAS-Count***  For description of this field see TS 33.401 [32] for EPC, and TS 33.501 [86] for 5GC. |
| ***ul-NAS-MAC***  For description of this field see TS 33.401 [32] for EPC, and TS 33.501 [86] for 5GC. |

#### – *RRCConnectionReject-NB*

The *RRCConnectionReject-NB* message is used to reject the RRC connection establishment or RRC connection resume or to reject the EDT procedure.

Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH

Direction: E‑UTRAN to UE

*RRCConnectionReject-NB* message

-- ASN1START

RRCConnectionReject-NB ::= SEQUENCE {

criticalExtensions CHOICE {

c1 CHOICE {

rrcConnectionReject-r13 RRCConnectionReject-NB-r13-IEs,

spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

RRCConnectionReject-NB-r13-IEs ::= SEQUENCE {

extendedWaitTime-r13 INTEGER (1..1800),

rrc-SuspendIndication-r13 ENUMERATED {true} OPTIONAL, -- Need ON

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

| *RRCConnectionReject-NB* field descriptions |
| --- |
| ***extendedWaitTime***  Value in seconds. |
| ***rrc-SuspendIndication***  If present, this field indicates that the UE should remain suspended and not release its stored context. |

#### – *RRCConnectionRelease-NB*

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

Signalling radio bearer: SRB1 or SRB1bis

RLC-SAP: AM

Logical channel: DCCH

Direction: E‑UTRAN to UE

*RRCConnectionRelease-NB* message

-- ASN1START

RRCConnectionRelease-NB ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

c1 CHOICE {

rrcConnectionRelease-r13 RRCConnectionRelease-NB-r13-IEs,

spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

RRCConnectionRelease-NB-r13-IEs ::= SEQUENCE {

releaseCause-r13 ReleaseCause-NB-r13,

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

extendedWaitTime-r13 INTEGER (1..1800) OPTIONAL, -- Need ON

redirectedCarrierInfo-r13 RedirectedCarrierInfo-NB-r13 OPTIONAL, -- Need ON

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension RRCConnectionRelease-NB-v1430-IEs OPTIONAL

}

RRCConnectionRelease-NB-v1430-IEs ::= SEQUENCE {

redirectedCarrierInfo-v1430 RedirectedCarrierInfo-NB-v1430 OPTIONAL, -- Cond Redirection

extendedWaitTime-CPdata-r14 INTEGER (1..1800) OPTIONAL, -- Cond NoExtendedWaitTime

nonCriticalExtension RRCConnectionRelease-NB-v1530-IEs OPTIONAL

}

RRCConnectionRelease-NB-v1530-IEs ::= SEQUENCE {

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

nextHopChainingCount-r15 NextHopChainingCount OPTIONAL, -- Cond EarlySec

nonCriticalExtension RRCConnectionRelease-NB-v1550-IEs OPTIONAL

}

RRCConnectionRelease-NB-v1550-IEs ::= SEQUENCE {

redirectedCarrierInfo-v1550 RedirectedCarrierInfo-NB-v1550 OPTIONAL, -- Cond Redirection-TDD

nonCriticalExtension RRCConnectionRelease-NB-v15b0-IEs OPTIONAL

}

RRCConnectionRelease-NB-v15b0-IEs ::= SEQUENCE {

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

nonCriticalExtension RRCConnectionRelease-NB-v1610-IEs OPTIONAL

}

RRCConnectionRelease-NB-v1610-IEs ::= SEQUENCE {

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

anr-MeasConfig-r16 ANR-MeasConfig-NB-r16 OPTIONAL, -- Need OP

pur-Config-r16 SetupRelease {PUR-Config-NB-r16}

OPTIONAL, -- Need ON

nonCriticalExtension RRCConnectionRelease-NB-v1700-IEs OPTIONAL

}

RRCConnectionRelease-NB-v1700-IEs ::= SEQUENCE {

cbpcg-Config-r17 ENUMERATED {pcg1, pcg2} OPTIONAL, -- Need OR

nonCriticalExtension SEQUENCE {} OPTIONAL

}

ReleaseCause-NB-r13 ::= ENUMERATED {loadBalancingTAUrequired, other,

rrc-Suspend, spare1}

RedirectedCarrierInfo-NB-r13::= CarrierFreq-NB-r13

RedirectedCarrierInfo-NB-v1430 ::= SEQUENCE {

redirectedCarrierOffsetDedicated-r14 ENUMERATED{

dB1, dB2, dB3, dB4, dB5, dB6, dB8, dB10,

dB12, dB14, dB16, dB18, dB20, dB22, dB24, dB26},

t322-r14 ENUMERATED{

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

spare1}

}

RedirectedCarrierInfo-NB-v1550::= CarrierFreq-NB-v1550

-- ASN1STOP

| *RRCConnectionRelease-NB* field descriptions |
| --- |
| ***cbpgc-Config***  Index to the coverage-based paging configuration Value *pcg1* corresponds to the first entry in *cbpcg-ConfigList* and *pcg2* corresponds to the second entry in *cbpcg-ConfigList* in *SystemInformationBlockType22-NB*. |
| ***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. |
| ***extendedWaitTime***  Value in seconds. |
| ***extendedWaitTime-CPdata***  Wait time for data transfer using the Control Plane CIoT EPS optimisation. Value in seconds. See TS 24.301 [35]. |
| ***noLastCellUpdate***  Presence of the field indicates that the last used cell for (G)WUS shall not be updated. |
| ***redirectedCarrierInfo***  The r*edirectedCarrierInfo* indicates a carrier frequency (downlink for FDD) and is used to redirect the UE to a NB-IoT carrier frequency, by means of the cell selection upon leaving RRC\_CONNECTED as specified in TS 36.304 [4]. |
| ***redirectedCarrierOffsetDedicated***  Parameter "Qoffsetdedicatedfrequency" in TS 36.304 [4]. For NB-IoT carrier frequencies, a UE that supports multi-band cells considers the *redirectedCarrierOffsetDedicated* to be common for all overlapping bands (i.e. regardless of the EARFCN that is used). |
| ***releaseCause***  The *releaseCause* is used to indicate the reason for releasing the RRC Connection.  E-UTRAN should not set the *releaseCause* to *loadBalancingTAURequired* if the *extendedWaitTime* is present and/or if the UE is connected to 5GC. |
| ***resumeIdentity***  UE identity to facilitate UE context retrieval at eNB. E-UTRAN configures *resumeIdentity-r13* only when the UE is connected to EPC and configures *resumeIdentity-r16* only when the UE is connected to 5GC. |
| ***t322***  Timer T322 as described in clause 7.3. Value minN corresponds to N minutes. |

| Conditional presence | Explanation |
| --- | --- |
| *NoExtendedWaitTime* | The field is optionally present, Need ON, if the *extendedWaitTime* is not included; otherwise the field is not present. |
| *Redirection* | The field is optionally present, Need ON, if *redirectedCarrierInfo* is included; otherwise the field is not present. |
| *Redirection-TDD* | The field is optionally present, Need ON, if *redirectedCarrierInfo* is included in TDD mode. Otherwise, the field is not present. |
| *UP-EDT* | The field is optionally present, Need ON, if the UE supports UP-EDT or UP transmission using PUR and *releaseCause* is set to *rrc-Suspend*; otherwise the field is not present. |
| *EarlySec* | For EPC, the field is optionally present, Need ON, if the UE supports early security reactivation or UP-EDT or UP transmission using PUR and *releaseCause* is set to *rrc-Suspend*; otherwise the field is not present.  For 5GC, the field is mandatory present if *releaseCause* is set to *rrc-Suspend*; otherwise the field is not present. |

#### – *RRCConnectionRequest-NB*

The *RRCConnectionRequest-NB* message is used to request the establishment of an RRC connection.

Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH

Direction: UE to E‑UTRAN

*RRCConnectionRequest-NB* message

-- ASN1START

RRCConnectionRequest-NB ::= SEQUENCE {

criticalExtensions CHOICE {

rrcConnectionRequest-r13 RRCConnectionRequest-NB-r13-IEs,

later CHOICE {

rrcConnectionRequest-r16 RRCConnectionRequest-5GC-NB-r16-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

}

RRCConnectionRequest-NB-r13-IEs ::= SEQUENCE {

ue-Identity-r13 InitialUE-Identity,

establishmentCause-r13 EstablishmentCause-NB-r13,

multiToneSupport-r13 ENUMERATED {true} OPTIONAL,

multiCarrierSupport-r13 ENUMERATED {true} OPTIONAL,

earlyContentionResolution-r14 BOOLEAN,

cqi-NPDCCH-r14 CQI-NPDCCH-NB-r14,

spare BIT STRING (SIZE (17))

}

RRCConnectionRequest-5GC-NB-r16-IEs ::= SEQUENCE {

ue-Identity-r16 InitialUE-Identity-5GC-NB-r16,

establishmentCause-r16 ENUMERATED {

mt-Access, mo-Signalling, mo-Data, mo-ExceptionData,

spare4, spare3, spare2, spare1},

cqi-NPDCCH-r16 CQI-NPDCCH-NB-r14,

spare BIT STRING (SIZE (11))

}

InitialUE-Identity-5GC-NB-r16 ::= CHOICE {

ng-5G-S-TMSI-r16 NG-5G-S-TMSI-r15,

randomValue BIT STRING (SIZE (48))

}

-- ASN1STOP

| *RRCConnectionRequest-NB* field descriptions |
| --- |
| ***earlyContentionResolution***  Value TRUE indicates UE supports MAC PDU containing the UE contention resolution identity MAC control element without RRC response message. This field is always set to TRUE in this version of the specification. |
| ***establishmentCause***  Provides the establishment cause for the RRC connection request as provided by the upper layers.  eNB is not expected to reject a *RRCConnectionRequest* due to unknown cause value being used by the UE. |
| ***multiCarrierSupport***  If present, this field indicates that the UE supports multi-carrier operation in the mode, FDD or TDD, used for access. |
| ***multiToneSupport***  If present, this field indicates that the UE supports UL multi-tone transmissions on NPUSCH in the mode, FDD or TDD, used for access. |
| ***randomValue***  Integer value in the range 0 to 248 − 1. |
| ***ue-Identity***  UE identity included to facilitate contention resolution by lower layers. |

#### – *RRCConnectionResume-NB*

The *RRCConnectionResume-NB* 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-NB* message

-- ASN1START

RRCConnectionResume-NB ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

c1 CHOICE {

rrcConnectionResume-r13 RRCConnectionResume-NB-r13-IEs,

spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

RRCConnectionResume-NB-r13-IEs ::= SEQUENCE {

radioResourceConfigDedicated-r13 RadioResourceConfigDedicated-NB-r13 OPTIONAL, -- Need ON

nextHopChainingCount-r13 NextHopChainingCount,

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

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension RRCConnectionResume-NB-v1610-IEs OPTIONAL

}

RRCConnectionResume-NB-v1610-IEs ::= SEQUENCE {

fullConfig-r16 ENUMERATED {true} OPTIONAL, -- Cond 5GC

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

| *RRCConnectionResume-NB* field descriptions |
| --- |
| ***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 while absence indicates that the header compression protocol context is reset. |
| ***fullConfig***  Indicates that the full configuration option is applicable for the *RRCConnectionResume-NB* message. |

| Conditional presence | Explanation |
| --- | --- |
| *5GC* | The field is optionally present, Need ON, if the UE is connected to 5GC; otherwise the field is not present. |

#### – *RRCConnectionResumeComplete-NB*

The *RRCConnectionResumeComplete-NB* message is used to confirm the successful completion of an RRC connection resumption

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E‑UTRAN

*RRCConnectionResumeComplete-NB* message

-- ASN1START

RRCConnectionResumeComplete-NB ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

rrcConnectionResumeComplete-r13 RRCConnectionResumeComplete-NB-r13-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

RRCConnectionResumeComplete-NB-r13-IEs ::= SEQUENCE {

selectedPLMN-Identity-r13 INTEGER (1..maxPLMN-r11) OPTIONAL,

dedicatedInfoNAS-r13 DedicatedInfoNAS OPTIONAL,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension RRCConnectionResumeComplete-NB-v1470-IEs OPTIONAL

}

RRCConnectionResumeComplete-NB-v1470-IEs ::= SEQUENCE {

measResultServCell-r14 MeasResultServCell-NB-r14 OPTIONAL,

nonCriticalExtension RRCConnectionResumeComplete-NB-v1610-IEs OPTIONAL

}

RRCConnectionResumeComplete-NB-v1610-IEs ::= SEQUENCE {

rlf-InfoAvailable-r16 ENUMERATED {true} OPTIONAL,

anr-InfoAvailable-r16 ENUMERATED {true} OPTIONAL,

nonCriticalExtension RRCConnectionResumeComplete-NB-v1710-IEs OPTIONAL

}

RRCConnectionResumeComplete-NB-v1710-IEs ::= SEQUENCE {

gnss-ValidityDuration-r17 GNSS-ValidityDuration-r17 OPTIONAL, nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

| *RRCConnectionResumeComplete-NB* field descriptions |
| --- |
| ***anr-InfoAvailable***  Indicates the availability of ANR measurement information. |
| ***measResultServCell***  This field refers to the last idle mode measurement results taken of the serving cell. |
| ***rlf-InfoAvailable***  Indicates the availability of radio link failure related information. |
| ***selectedPLMN-Identity***  Index of the PLMN selected by the UE from the *plmn-IdentityList* included in *SystemInformationBlockType1-NB*. 1 if the 1st PLMN is selected from the *plmn-IdentityList* included in SIB1-NB, 2 if the 2nd PLMN is selected from the *plmn-IdentityList* included in SIB1-NB and so on. |

#### – *RRCConnectionResumeRequest-NB*

The *RRCConnectionResumeRequest-NB* message is used to request the resumption of a suspended RRC connection or to perform UP-EDT.

Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH

Direction: UE to E‑UTRAN

*RRCConnectionResumeRequest-NB* message

-- ASN1START

RRCConnectionResumeRequest-NB ::= SEQUENCE {

criticalExtensions CHOICE {

rrcConnectionResumeRequest-r13 RRCConnectionResumeRequest-NB-r13-IEs,

later CHOICE {

rrcConnectionResumeRequest-r16 RRCConnectionResumeRequest-5GC-NB-r16-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

}

RRCConnectionResumeRequest-NB-r13-IEs ::= SEQUENCE {

resumeID-r13 ResumeIdentity-r13,

shortResumeMAC-I-r13 ShortMAC-I,

resumeCause-r13 EstablishmentCause-NB-r13,

earlyContentionResolution-r14 BOOLEAN,

cqi-NPDCCH-r14 CQI-NPDCCH-NB-r14,

anr-InfoAvailable-r16 BOOLEAN,

spare BIT STRING (SIZE (3))

}

RRCConnectionResumeRequest-5GC-NB-r16-IEs ::= SEQUENCE {

resumeID-r16 I-RNTI-r15,

shortResumeMAC-I-r16 ShortMAC-I,

resumeCause-r16 EstablishmentCause-NB-r13,

cqi-NPDCCH-r16 CQI-NPDCCH-NB-r14,

spare BIT STRING (SIZE (4))

}

-- ASN1STOP

| *RRCConnectionResumeRequest-NB* field descriptions |
| --- |
| ***anr-InfoAvailable***  Indicates the availability of ANR measurement information when the UE is perfoming UP-EDT. |
| ***earlyContentionResolution***  Value TRUE indicates UE supports MAC PDU containing the UE contention resolution identity MAC control element without RRC response message. This field is always set to TRUE in this version of the specification. |
| ***resumeCause***  Provides the resume cause for the RRC connection resume request as provided by the upper layers.  eNB is not expected to reject a *RRCConnectionResumeRequest* due to unknown cause value being used by the UE. |
| ***resumeID***  UE identity to facilitate UE context retrieval at eNB. |
| ***shortResumeMAC-I***  Authentication token to facilitate UE authentication at eNB. |

#### – *RRCConnectionSetup-NB*

The *RRCConnectionSetup-NB* message is used to establish SRB1 and SRB1bis.

Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH

Direction: E‑UTRAN to UE

*RRCConnectionSetup-NB* message

-- ASN1START

RRCConnectionSetup-NB ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

c1 CHOICE {

rrcConnectionSetup-r13 RRCConnectionSetup-NB-r13-IEs,

spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

RRCConnectionSetup-NB-r13-IEs ::= SEQUENCE {

radioResourceConfigDedicated-r13 RadioResourceConfigDedicated-NB-r13,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension RRCConnectionSetup-NB-v1610-IEs OPTIONAL

}

RRCConnectionSetup-NB-v1610-IEs ::= SEQUENCE {

dedicatedInfoNAS-r16 DedicatedInfoNAS OPTIONAL, -- Need ON

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

| *RRCConnectionSetup-NB* 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*. |

#### – *RRCConnectionSetupComplete-NB*

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

Signalling radio bearer: SRB1bis

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E‑UTRAN

*RRCConnectionSetupComplete-NB* message

-- ASN1START

RRCConnectionSetupComplete-NB ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE{

rrcConnectionSetupComplete-r13 RRCConnectionSetupComplete-NB-r13-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

RRCConnectionSetupComplete-NB-r13-IEs ::= SEQUENCE {

selectedPLMN-Identity-r13 INTEGER (1..maxPLMN-r11),

s-TMSI-r13 S-TMSI OPTIONAL,

registeredMME-r13 RegisteredMME OPTIONAL,

dedicatedInfoNAS-r13 DedicatedInfoNAS,

attachWithoutPDN-Connectivity-r13 ENUMERATED {true} OPTIONAL,

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

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension RRCConnectionSetupComplete-NB-v1430-IEs OPTIONAL

}

RRCConnectionSetupComplete-NB-v1430-IEs ::= SEQUENCE {

gummei-Type-r14 ENUMERATED { mapped} OPTIONAL,

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

nonCriticalExtension RRCConnectionSetupComplete-NB-v1470-IEs OPTIONAL

}

RRCConnectionSetupComplete-NB-v1470-IEs ::= SEQUENCE {

measResultServCell-r14 MeasResultServCell-NB-r14 OPTIONAL,

nonCriticalExtension RRCConnectionSetupComplete-NB-v1610-IEs OPTIONAL

}

RRCConnectionSetupComplete-NB-v1610-IEs ::= SEQUENCE {

ng-5G-S-TMSI-r16 NG-5G-S-TMSI-r15 OPTIONAL,

registeredAMF-r16 RegisteredAMF-r15 OPTIONAL,

gummei-Type-v1610 ENUMERATED {mappedFrom5G} OPTIONAL,

guami-Type-r16 ENUMERATED {native, mapped} OPTIONAL,

s-NSSAI-list-r16 SEQUENCE(SIZE (1..maxNrofS-NSSAI-r15)) OF

S-NSSAI-r15 OPTIONAL,

ng-U-DataTransfer-r16 ENUMERATED {true} OPTIONAL,

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

rlf-InfoAvailable-r16 ENUMERATED {true} OPTIONAL,

anr-InfoAvailable-r16 ENUMERATED {true} OPTIONAL,

pur-ConfigID-r16 PUR-ConfigID-NB-r16 OPTIONAL,

nonCriticalExtension RRCConnectionSetupComplete-NB-v1710-IEs OPTIONAL

}

RRCConnectionSetupComplete-NB-v1710-IEs ::= SEQUENCE {

gnss-ValidityDuration-r17 GNSS-ValidityDuration-r17 OPTIONAL, nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

| *RRCConnectionSetupComplete-NB* field descriptions |
| --- |
| ***anr-InfoAvailable***  This field is used to indicate the availability of ANR measurement information. |
| ***attachWithoutPDN-Connectivity***  This field is used to indicate that the UE performs an Attach without PDN connectivity procedure, as indicated by the upper layers, TS 24.301 [35]. |
| ***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 that the GUMMEI included is mapped (from 2G/3G identifiers or 5G identifiers) as indicated by the upper layers, TS 24.301 [35] and TS 24.501 [95]. The value *mapped* indicates the GUMMEI is mapped from 2G/3G identifiers, and *mappedFrom5G* indicates the GUMMEI is mapped from 5G identifiers. A UE shall not include both *gummei-Type-r14* and *gummei-Type-v1610*. |
| ***measResultServCell***  This field refers to the last idle mode measurement results taken of the serving cell. |
| ***ng-U-DataTransfer***  This field is included when the UE supports NG-U data transfer, as indicated by the upper layers, see TS 24.501 [95]. |
| ***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. |
| ***rlf-InfoAvailable***  This field is used to indicate the availability of radio link failure related information. |
| ***selectedPLMN-Identity***  Index of the PLMN selected by the UE from the *plmn-IdentityList* included in *SystemInformationBlockType1-NB*. 1 if the 1st PLMN is selected from the *plmn-IdentityList* included in SIB1, 2 if the 2nd PLMN is selected from the *plmn-IdentityList* included in 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]. |
| ***up-CIoT-5GS-Optimisation***  This field is included when the UE supports 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 S1-U data transfer or the User plane CIoT EPS Optimisation, as indicated by the upper layers, see TS 24.301 [35]. |

#### – *RRCEarlyDataComplete-NB*

The *RRCEarlyDataComplete-NB* message is used to confirm the successful completion of the CP-EDT procedure.

Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH

Direction: E‑UTRAN to UE

*RRCEarlyDataComplete-NB* message

-- ASN1START

RRCEarlyDataComplete-NB-r15 ::= SEQUENCE {

criticalExtensions CHOICE {

rrcEarlyDataComplete-r15 RRCEarlyDataComplete-NB-r15-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

RRCEarlyDataComplete-NB-r15-IEs ::= SEQUENCE {

dedicatedInfoNAS-r15 DedicatedInfoNAS OPTIONAL, -- Need ON

extendedWaitTime-r15 INTEGER (1..1800) OPTIONAL, -- Need ON

redirectedCarrierInfo-r15 RedirectedCarrierInfo-NB-r13 OPTIONAL, -- Need ON

redirectedCarrierInfoExt-r15 RedirectedCarrierInfo-NB-v1430 OPTIONAL, -- Cond Redirection

nonCriticalExtension RRCEarlyDataComplete-NB-v1590-IEs OPTIONAL

}

RRCEarlyDataComplete-NB-v1590-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension RRCEarlyDataComplete-NB-v1700-IEs OPTIONAL

}

RRCEarlyDataComplete-NB-v1700-IEs ::= SEQUENCE {

cbpcg-Config-r17 ENUMERATED {pcg1, pcg2} OPTIONAL, -- Need OR

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

| *RRCEarlyDataComplete-NB* field descriptions |
| --- |
| ***cbpcg-Config***  Index to the coverage-based configuration. Value *pcg1* corresponds to the first entry in *cbpcg-ConfigList* and, *pcg2* corresponds to the second entry in *cbpcg-ConfigList* in *SystemInformationBlockType22-NB*. |
| ***extendedWaitTime***  Value in seconds. |

| Conditional presence | Explanation |
| --- | --- |
| *Redirection* | The field is optionally present, Need ON, if *redirectedCarrierInfo* is included; otherwise the field is not present. |

#### – *RRCEarlyDataRequest-NB*

The *RRCEarlyDataRequest-NB* message is used to initiate CP-EDT.

Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH

Direction: UE to E‑UTRAN

*RRCEarlyDataRequest-NB* message

-- ASN1START

RRCEarlyDataRequest-NB-r15 ::= SEQUENCE {

criticalExtensions CHOICE {

rrcEarlyDataRequest-r15 RRCEarlyDataRequest-NB-r15-IEs,

later CHOICE {

rrcEarlyDataRequest-r16 RRCEarlyDataRequest-5GC-NB-r16-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

}

RRCEarlyDataRequest-NB-r15-IEs ::= SEQUENCE {

s-TMSI-r15 S-TMSI,

establishmentCause-r15 ENUMERATED {mo-Data, mo-ExceptionData, delayTolerantAccess, mt-Access-v1610},

cqi-NPDCCH-r15 CQI-NPDCCH-NB-r14 OPTIONAL,

dedicatedInfoNAS-r15 DedicatedInfoNAS,

nonCriticalExtension RRCEarlyDataRequest-NB-v1590-IEs OPTIONAL

}

RRCEarlyDataRequest-NB-v1590-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

RRCEarlyDataRequest-5GC-NB-r16-IEs ::= SEQUENCE {

ng-5G-S-TMSI-r16 NG-5G-S-TMSI-r15,

establishmentCause-r16 ENUMERATED {mo-Data, mo-ExceptionData, mt-Access, spare1},

cqi-NPDCCH-r16 CQI-NPDCCH-NB-r14 OPTIONAL,

dedicatedInfoNAS-r16 DedicatedInfoNAS,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

| *RRCEarlyDataRequest-NB* field descriptions |
| --- |
| ***establishmentCause***  Provides the establishment cause for the RRC early data request as provided by the upper layers.  eNB is not expected to reject a *RRCEarlyDataRequest* due to unknown cause value being used by the UE. |

#### – *SCPTMConfiguration-NB*

The *SCPTMConfiguration-NB* message contains the control information applicable for MBMS services transmitted via SC-MRB.

Signalling radio bearer: N/A

RLC-SAP: UM

Logical channel: SC-MCCH

Direction: E‑UTRAN to UE

*SCPTMConfiguration-NB message*

-- ASN1START

SCPTMConfiguration-NB-r14 ::= SEQUENCE {

sc-mtch-InfoList-r14 SC-MTCH-InfoList-NB-r14,

scptm-NeighbourCellList-r14 SCPTM-NeighbourCellList-NB-r14 OPTIONAL, -- Need OP

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SCPTMConfiguration-NB-v1610 OPTIONAL

}

SCPTMConfiguration-NB-v1610 ::= SEQUENCE {

sc-mtch-InfoListMultiTB-r16 SC-MTCH-InfoList-NB-r14,

multiTB-Gap-r16 ENUMERATED {sf16, sf32, sf64, sf128} OPTIONAL, -- Need OR

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

| ***SCPTMConfiguration-NB* field descriptions** |
| --- |
| ***multiTB-Gap***  Indicates the scheduling gap for SC-MTCH using multiple TB scheduling, see TS 36.211 [21] and TS 36.213 [23]. Value *sf16* corresponds to 16 subframes, *sf32* corresponds to 32 subframes, and so on. If the field is absent, there is no scheduling gap. |
| ***sc-mtch-InfoList***  Provides the configuration of each SC-MTCH not using multiple TB scheduling in the current cell. |
| ***sc-mtch-InfoListMultiTB***  Provides the configuration of each SC-MTCH using multiple TB scheduling in the current cell.  The total number of signalled SC-MTCH configuration in *sc-mtch-InfoList* and *sc-mtch-InfoListMultiTB* cannot be more than *maxSC-MTCH-NB-r14*. |
| ***scptm-NeighbourCellList***  List of neighbour cells providing MBMS services via SC-MRB. When absent, the UE shall assume that MBMS services listed in the *SCPTMConfiguration-NB* message are not provided via SC-MRB in any neighbour cell. |

#### – *SystemInformation-NB*

The *SystemInformation-NB* message is used to convey one or more System Information Blocks. All the SIBs included are transmitted with the same periodicity.

Signalling radio bearer: N/A

RLC-SAP: TM

Logical channel: BCCH

Direction: E‑UTRAN to UE

*SystemInformation-NB* message

-- ASN1START

SystemInformation-NB ::= SEQUENCE {

criticalExtensions CHOICE {

systemInformation-r13 SystemInformation-NB-r13-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

SystemInformation-NB-r13-IEs ::= SEQUENCE {

sib-TypeAndInfo-r13 SEQUENCE (SIZE (1..maxSIB)) OF CHOICE {

sib2-r13 SystemInformationBlockType2-NB-r13,

sib3-r13 SystemInformationBlockType3-NB-r13,

sib4-r13 SystemInformationBlockType4-NB-r13,

sib5-r13 SystemInformationBlockType5-NB-r13,

sib14-r13 SystemInformationBlockType14-NB-r13,

sib16-r13 SystemInformationBlockType16-NB-r13,

...,

sib15-v1430 SystemInformationBlockType15-NB-r14,

sib20-v1430 SystemInformationBlockType20-NB-r14,

sib22-v1430 SystemInformationBlockType22-NB-r14,

sib23-v1530 SystemInformationBlockType23-NB-r15,

sib27-v1610 SystemInformationBlockType27-NB-r16,

sib31-v1700 SystemInformationBlockType31-NB-r17,

sib32-v1700 SystemInformationBlockType32-NB-r17

},

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

#### – *SystemInformationBlockType1-NB*

The *SystemInformationBlockType1-NB* messagecontains information relevant when evaluating if a UE is allowed to access a cell and defines the scheduling of other system information.

Signalling radio bearer: N/A

RLC-SAP: TM

Logical channel: BCCH

Direction: E‑UTRAN to UE

*SystemInformationBlockType1-NB* message

-- ASN1START

SystemInformationBlockType1-NB ::= SEQUENCE {

hyperSFN-MSB-r13 BIT STRING (SIZE (8)),

cellAccessRelatedInfo-r13 SEQUENCE {

plmn-IdentityList-r13 PLMN-IdentityList-NB-r13,

trackingAreaCode-r13 TrackingAreaCode,

cellIdentity-r13 CellIdentity,

cellBarred-r13 ENUMERATED {barred, notBarred},

intraFreqReselection-r13 ENUMERATED {allowed, notAllowed}

},

cellSelectionInfo-r13 SEQUENCE {

q-RxLevMin-r13 Q-RxLevMin,

q-QualMin-r13 Q-QualMin-r9

},

p-Max-r13 P-Max OPTIONAL, -- Need OP

freqBandIndicator-r13 FreqBandIndicator-NB-r13,

freqBandInfo-r13 NS-PmaxList-NB-r13 OPTIONAL, -- Need OR

multiBandInfoList-r13 MultiBandInfoList-NB-r13 OPTIONAL, -- Need OR

downlinkBitmap-r13 DL-Bitmap-NB-r13 OPTIONAL, -- Cond SIB1

eutraControlRegionSize-r13 ENUMERATED {n1, n2, n3} OPTIONAL, -- Cond inband

nrs-CRS-PowerOffset-r13 ENUMERATED {dB-6, dB-4dot77, dB-3,

dB-1dot77, dB0, dB1,

dB1dot23, dB2, dB3,

dB4, dB4dot23, dB5,

dB6, dB7, dB8,

dB9} OPTIONAL, -- Cond inband-SamePCI

schedulingInfoList-r13 SchedulingInfoList-NB-r13,

si-WindowLength-r13 ENUMERATED {ms160, ms320, ms480, ms640,

ms960, ms1280, ms1600, spare1},

si-RadioFrameOffset-r13 INTEGER (1..15) OPTIONAL, -- Need OP

systemInfoValueTagList-r13 SystemInfoValueTagList-NB-r13 OPTIONAL, -- Need OR

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SystemInformationBlockType1-NB-v1350 OPTIONAL

}

SystemInformationBlockType1-NB-v1350 ::= SEQUENCE {

cellSelectionInfo-v1350 CellSelectionInfo-NB-v1350 OPTIONAL, -- Cond Qrxlevmin

nonCriticalExtension SystemInformationBlockType1-NB-v1430 OPTIONAL

}

SystemInformationBlockType1-NB-v1430 ::= SEQUENCE {

cellSelectionInfo-v1430 CellSelectionInfo-NB-v1430 OPTIONAL, -- Need OR

nonCriticalExtension SystemInformationBlockType1-NB-v1450 OPTIONAL

}

SystemInformationBlockType1-NB-v1450 ::= SEQUENCE {

nrs-CRS-PowerOffset-v1450 ENUMERATED {dB-6, dB-4dot77, dB-3,

dB-1dot77, dB0, dB1,

dB1dot23, dB2, dB3,

dB4, dB4dot23, dB5,

dB6, dB7, dB8,

dB9} OPTIONAL, -- Cond inband-SamePCI-ExceptAnchor

nonCriticalExtension SystemInformationBlockType1-NB-v1530 OPTIONAL

}

SystemInformationBlockType1-NB-v1530 ::= SEQUENCE {

tdd-Parameters-r15 SEQUENCE {

tdd-Config-r15 TDD-Config-NB-r15,

tdd-SI-CarrierInfo-r15 ENUMERATED {anchor, non-anchor},

tdd-SI-SubframesBitmap-r15 DL-Bitmap-NB-r13 OPTIONAL -- Cond TDD-SI-NonAnchor

} OPTIONAL, -- Cond TDD

schedulingInfoList-v1530 SchedulingInfoList-NB-v1530 OPTIONAL, -- Need OR

nonCriticalExtension SystemInformationBlockType1-NB-v1610 OPTIONAL

}

SystemInformationBlockType1-NB-v1610 ::= SEQUENCE {

cellAccessRelatedInfo-5GC-r16 SEQUENCE {

plmn-IdentityList-r16 PLMN-IdentityList-5GC-NB-r16,

trackingAreaCode-5GC-r16 TrackingAreaCode-5GC-r15,

cellIdentity-r16 CellIdentity OPTIONAL, -- Need OP

cellBarred-5GC-r16 ENUMERATED {barred, notBarred}

} OPTIONAL, -- Need OR

nonCriticalExtension SystemInformationBlockType1-NB-v1700 OPTIONAL

}

SystemInformationBlockType1-NB-v1700 ::= SEQUENCE {

cellAccessRelatedInfo-NTN-r17 SEQUENCE {

cellBarred-NTN-r17 ENUMERATED {barred, notBarred},

plmn-IdentityList-v1700 PLMN-IdentityList-NB-v1700 OPTIONAL -- Need OR

} OPTIONAL, -- Need OR

nonCriticalExtension SEQUENCE {} OPTIONAL

}

PLMN-IdentityList-NB-r13 ::= SEQUENCE (SIZE (1..maxPLMN-r11)) OF PLMN-IdentityInfo-NB-r13

PLMN-IdentityList-5GC-NB-r16 ::= SEQUENCE (SIZE (1..maxPLMN-r11)) OF PLMN-IdentityInfo-5GC-NB-r16

PLMN-IdentityList-NB-v1700::= SEQUENCE (SIZE (1..maxPLMN-r11)) OF PLMN-IdentityInfo-NB-v1700

PLMN-IdentityInfo-NB-r13 ::= SEQUENCE {

plmn-Identity-r13 PLMN-Identity,

cellReservedForOperatorUse-r13 ENUMERATED {reserved, notReserved},

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

}

PLMN-IdentityInfo-5GC-NB-r16 ::= SEQUENCE {

plmn-Identity-5GC-r16 CHOICE {

plmn-Identity-r16 PLMN-Identity,

plmn-Index-r16 INTEGER (1..maxPLMN-r11)

},

cellReservedForOperatorUse-r16 ENUMERATED {reserved, notReserved},

ng-U-DataTransfer-r16 ENUMERATED {true} OPTIONAL, -- Need OR

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

}

PLMN-IdentityInfo-NB-v1700 ::= SEQUENCE {

trackingAreaList-r17 TrackingAreaList-NB-r17 OPTIONAL -- Need OP

}

TrackingAreaList-NB-r17 ::= SEQUENCE (SIZE (1..maxTAC-NB-r17)) OF TrackingAreaCode

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

SchedulingInfoList-NB-v1530 ::= SEQUENCE (SIZE (1..maxSI-Message-NB-r13)) OF SchedulingInfo-NB-v1530

SchedulingInfo-NB-r13::= SEQUENCE {

si-Periodicity-r13 ENUMERATED {rf64, rf128, rf256, rf512,

rf1024, rf2048, rf4096, spare},

si-RepetitionPattern-r13 ENUMERATED {every2ndRF, every4thRF, every8thRF, every16thRF},

sib-MappingInfo-r13 SIB-MappingInfo-NB-r13,

si-TB-r13 ENUMERATED {b56, b120, b208, b256, b328, b440, b552, b680}

}

SchedulingInfo-NB-v1530::= SEQUENCE {

sib-MappingInfo-v1530 SIB-MappingInfo-NB-v1530 OPTIONAL -- Need OR

}

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

SystemInfoValueTagSI-r13

SIB-MappingInfo-NB-r13 ::= SEQUENCE (SIZE (0..maxSIB-1)) OF SIB-Type-NB-r13

SIB-MappingInfo-NB-v1530 ::= SEQUENCE (SIZE (1..8)) OF SIB-Type-NB-v1530

SIB-Type-NB-r13 ::= ENUMERATED {

sibType3-NB-r13, sibType4-NB-r13, sibType5-NB-r13,

sibType14-NB-r13, sibType16-NB-r13, sibType15-NB-r14,

sibType20-NB-r14, sibType22-NB-r14}

SIB-Type-NB-v1530 ::= ENUMERATED {

sibType23-NB-r15, sibType27-NB-r16, sibType31-NB-r17,

sibType32-NB-r17, spare4, spare3, spare2, spare1}

CellSelectionInfo-NB-v1350 ::= SEQUENCE {

delta-RxLevMin-v1350 INTEGER (-8..-1)

}

CellSelectionInfo-NB-v1430 ::= SEQUENCE {

powerClass14dBm-Offset-r14 ENUMERATED {dB-6, dB-3, dB3, dB6, dB9, dB12} OPTIONAL, -- Need OP

ce-authorisationOffset-r14 ENUMERATED {dB5, dB10, dB15, dB20, dB25, dB30, dB35} OPTIONAL -- Need OP

}

-- ASN1STOP

| *SystemInformationBlockType1-NB* field descriptions |
| --- |
| ***attachWithoutPDN-Connectivity***  If present, the field indicates that attach without PDN connectivity as specified in TS 24.301 [35] is supported for this PLMN. |
| ***ce-authorisationOffset***  Parameter "Qoffsetauthorization" in TS 36.304 [4]. Value in dB. Value dB5 corresponds to 5 dB, dB10 corresponds to 10 dB and so on.  If the field is absent, the value of 0 dB shall be used for "Qoffsetauthorization". |
| ***cellBarred***  Barred means the cell is barred for connectivity to EPC, as defined in TS 36.304 [4]. |
| ***cellBarred-5GC***  Barred means the cell is barred for connectivity to 5GC, as defined in TS 36.304 [4]. |
| ***cellBarred-NTN***  Barred means the cell is barred for connectivity to NTN, as defined in TS 36.304 [4].  E-UTRAN always includes *cellBarred-NTN* and sets *cellBarred* to ‘barred’ in an NTN cell. |
| ***cellIdentity***  Indicates the cell identity.  If the field is absent in *cellAccessRelatedInfo-5GC*, the cell identity indicated by the *cellIdentity* field included in *cellAccessRelatedInfo* for EPC is used when connected to 5GC. |
| ***cellReservedForOperatorUse***  As defined in TS 36.304 [4]. |
| ***cellSelectionInfo***  Cell selection information as specified in TS 36.304 [4]. |
| ***downlinkBitmap***  For FDD, NB-IoT downlink subframe configuration for downlink transmission as specified in TS 36.213 [23], clause 16.4.  For TDD, NB-IoT downlink, uplink and special subframes configuration for transmission on the anchor carrier as specified in TS 36.213 [23], clause 16.4. If the bitmap is not present, the UE shall assume that all subframes are valid (except for subframes carrying NPSS/NSSS/NPBCH/SIB1-NB) as specified in TS 36.213 [23], clause 16.4. |
| ***eutraControlRegionSize***  Indicates the control region size of the E-UTRA cell for the in-band operation mode, see TS 36.213 [23]. Unit is in number of OFDM symbols. |
| ***freqBandInfo***  A list of *additionalPmax* and *additionalSpectrumEmission* values as defined in TS 36.101 [42], clause 6.2.4F for the frequency band in *freqBandIndicator*. |
| ***hyperSFN-MSB***  Indicates the 8 most significant bits of hyper-SFN. Together with hyperSFN-LSB in MIB-NB, the complete hyper-SFN is built up. hyper-SFN is incremented by one when the SFN wraps around. |
| ***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]. |
| ***multiBandInfoList***  A list of additional frequency band indicators, *additionalPmax* and *additionalSpectrumEmission* values, as defined in TS 36.101 [42], table 5.5-1. If the UE supports the frequency band in the *freqBandIndicator* IE it shall apply that frequency band. Otherwise, the UE shall apply the first listed band which it supports in the *multiBandInfoList* IE. |
| ***ng-U-DataTransfer***  Indicates whether the NG-U data transfer as specified in TS 24.501 [95] is supported. |
| ***nrs-CRS-PowerOffset***  NRS power offset between NRS and E-UTRA CRS, see TS 36.213 [23], clause 16.2.2. Unit in dB. Default value of 0. |
| ***plmn-IdentityList***  List of PLMN identities. The first listed PLMN-Identity is the primary PLMN. If *plmn-IdentityList-v1700* is included, E-UTRAN includes the same number of entries, and listed in the same order, as in *plmn-IdentityList-r13*. |
| ***plmn-Index***  Index of the PLMN in the *plmn-IdentityList* field included in *cellAccessRelatedInfo* for EPC, indicating the same PLMN ID is used when connected to 5GC. |
| ***powerClass14dBm-Offset***  Parameter "Poffset" in TS 36.304 [4]. Only applicable for UE supporting *powerClassNB-14dBm*. Value in dB. Value dB-6 corresponds to -6 dB, dB-3 corresponds to -3 dB and so on. If the fied is absent, the UE applies the (default) value of 0 dB for "Poffset" in TS 36.304 [4]. |
| ***p-Max***  Value applicable for the cell. If absent the UE applies the maximum power according to the UE capability. |
| ***q-QualMin***  Parameter "Qqualmin" in TS 36.304 [4]. |
| ***q-RxLevMin, delta-RxLevMin***  Parameter Qrxlevmin in TS 36.304 [4]. If *delta-RxLevMin* is not included, actual value Qrxlevmin = *q-RxLevMin* \* 2 [dBm]. If *delta-RxLevMin* is included, actual value Qrxlevmin = (*q-RxLevMin* + *delta-RxLevMin*) \* 2 [dBm]. |
| ***schedulingInfoList***  Indicates additional scheduling information of SI messages. |
| ***si-Periodicity***  Periodicity of the SI-message in radio frames, such that rf256 denotes 256 radio frames, rf512 denotes 512 radio frames, and so on. |
| ***si-RadioFrameOffset***  Offset in number of radio frames to calculate the start of the SI window.  If the field is absent, no offset is applied. |
| ***si-RepetitionPattern***  Indicates the starting radio frames within the SI window used for SI message transmission. Value every2ndRF corresponds to every 2 radio frames, value every4thRF corresponds to every 4 radio frames and so on. The first transmission of the SI message is transmitted from the first radio frame of the SI window. |
| ***si-TB***  This field indicates the transport block size in number of bits and the corresponding number of consecutive NB-IoT downlink subframes that are used to broadcast the SI message. Value b56 corresponds to 56 bits, b120 corresponds to 120 bits and so on. TBS of 56 bits and 120 bits are transmitted over 2 sub-frames, other TBS are transmitted over 8 sub-frames, see TS 36.213 [23], Table 16.4.1.5.1-1. |
| ***si-WindowLength***  Common SI scheduling window for all SIs. Unit in milliseconds, where ms160 denotes 160 milliseconds, ms320 denotes 320 milliseconds and so on. |
| ***sib-MappingInfo***  List of the SIBs mapped to this *SystemInformation* message. There is no mapping information of SIB2-NB; it is always present in the first *SystemInformation* message listed in the *schedulingInfoList* list. |
| ***systemInfoValueTagList***  Indicates SI message specific value tags. It includes the same number of entries, and listed in the same order, as in SchedulingInfoList. |
| ***systemInfoValueTagSI***  SI message specific value tag as specified in Clause 5.2.1.3. Common for all SIBs within the SI message other than SIB14-NB and SIB31-NB. |
| ***tdd-Config***  Indicates the the TDD specific physical channel configuration. |
| ***tdd-SI-CarrierInfo***  Carrier used for SI message transmission. Value *anchor* corresponds to anchor carrier, value *non-anchor* corresponds to non-anchor carrier. See TS 36.213 [23].  When *tdd-SI-CarrierInfo* set to value *non-anchor* then *sib-GuardbandInfo* in MIB-TDD-NB (in case of *operationmodeInfo* is set to *guardband*) or *sib-InbandLocation* in MIB-TDD-NB (in case of *operationmodeInfo* is set to *inband-SamePCI* or *inband-DifferentPCI*) or *sib-StandaloneLocation* in MIB-TDD-NB (in case of *operationmodeInfo* is set to *standalone)* defines which non-anchor carrier is used (see MIB-NB-TDD). |
| ***tdd-SI-SubframesBitmap***  NB-IoT downlink, uplink and special subframes configuration for transmission on the carrier carrying the SI message as specified in TS 36.213 [23], clause 16.4. |
| ***trackingAreaCode, trackingAreaCode-5GC***  A *trackingAreaCode* that is common for all the PLMNs listed in *plmn-IdentityList-r13* or *plmn-IdentityList-r16 respectively*. |
| ***trackingAreaList***  A list of tracking area codes for the PLMN listed.  For the first entry in *plmn-IdentityList-v1700*: If this field is present, the list of tracking area codes include the tracking area code in *trackingAreaCode-r13* and the tracking area codes in *trackingAreaList*. If this field is absent, only *trackingAreaCode-r13* applies.  For other entries in *plmn-IdentityList-v1700*: If this field is present, the list of tracking area codes include the tracking area codes in *trackingAreaList*. If this field is absent, the list of tracking area codes of the preceding entry in *plmn-IdentityList-v1700* applies.  The total number of signalled tracking area codes across all PLMNs cannot be more than *maxTAC-NB-r17*. |
| ***up-CIoT-5GS-Optimisation***  Indicates whether the UE is allowed to resume the connection with User plane CIoT 5GS Optimisation, see TS24.501 [95]. |

| Conditional presence | Explanation |
| --- | --- |
| *inband* | In FDD: The field is mandatory present if IE *operationModeInfo* in MIB-NB is set to *inband-SamePCI* or *inband-DifferentPCI*. Otherwise the field is not present.  In TDD: The field is mandatory present if:  - IE *operationModeInfo* in MIB-TDD-NB is set to *inband-SamePCI* or *inband-DifferentPCI* or  - IE *operationModeInfo* in MIB-TDD-NB is set to *guardband* and IE *sib-GuardbandInfo* in MIB-TDD-NB is set to *sib-GuardbandInbandSamePCI* or *sib-GuardbandinbandDiffPCI* and IE *tdd-SI-CarrierInfo* is set to non-anchor |
| *inband-SamePCI* | The field is mandatory present, if IE *operationModeInfo* in MIB-NB is set *to inband-SamePCI.* Otherwise the field is not present. |
| *inband-SamePCI-ExceptAnchor* | The field is optionally present if IE *operationModeInfo* in MIB-NB is set toavalue other than *inband-SamePCI*, and at least one non-anchor carrier is inband carrier and uses the same PCI as the E-UTRA carrier*.* Otherwise the field is not present. |
| *Qrxlevmin* | This field is optionally present, Need OR, if *q-RxLevMin* is set to the minimum value. Otherwise the field is not present. |
| *SIB1* | The field is mandatory present if IE *additionalTransmissionSIB1* in MIB-NB is set to *TRUE*. Otherwise the field is optionally present, Need OP. |
| *TDD* | The field is mandatory present for TDD; otherwise the field is not present and the UE shall delete any existing value for this field. |
| *TDD-SI-NonAnchor* | The field is mandatory present for TDD if *si-CarrierInfo* is set to *non-anchor*; otherwise the field is not present and the UE shall delete any existing value for this field. |

#### – *UECapabilityEnquiry-NB*

The *UECapabilityEnquiry-NB* message is used to request the transfer of UE radio access capabilities for NB-IoT.

Signalling radio bearer: SRB1 or SRB1bis

RLC-SAP: AM

Logical channel: DCCH

Direction: E‑UTRAN to UE

*UECapabilityEnquiry-NB* message

-- ASN1START

UECapabilityEnquiry-NB ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

c1 CHOICE {

ueCapabilityEnquiry-r13 UECapabilityEnquiry-NB-r13-IEs,

spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

UECapabilityEnquiry-NB-r13-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

#### – *UECapabilityInformation-NB*

The *UECapabilityInformation-NB* message is used to transfer of UE radio access capabilities requested by the E‑UTRAN.

Signalling radio bearer: SRB1 or SRB1bis

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E‑UTRAN

*UECapabilityInformation-NB* message

-- ASN1START

UECapabilityInformation-NB ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE{

ueCapabilityInformation-r13 UECapabilityInformation-NB-r13-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

UECapabilityInformation-NB-r13-IEs ::= SEQUENCE {

ue-Capability-r13 UE-Capability-NB-r13,

ue-RadioPagingInfo-r13 UE-RadioPagingInfo-NB-r13,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension UECapabilityInformation-NB-Ext-r14-IEs OPTIONAL

}

UECapabilityInformation-NB-Ext-r14-IEs ::= SEQUENCE {

ue-Capability-ContainerExt-r14 OCTET STRING (CONTAINING UE-Capability-NB-Ext-r14-IEs),

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

| *UECapabilityInformation-NB* field descriptions |
| --- |
| ***ue-RadioPagingInfo***  This field contains UE capability information used for paging. |

#### – *UEInformationRequest-NB*

The *UEInformationRequest-NB* is the command used by E-UTRAN to retrieve information from the UE.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: E‑UTRAN to UE

*UEInformationRequest-NB message*

-- ASN1START

UEInformationRequest-NB-r16 ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

ueInformationRequest-r16 UEInformationRequest-NB-r16-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

UEInformationRequest-NB-r16-IEs ::= SEQUENCE {

rach-ReportReq-r16 BOOLEAN,

rlf-ReportReq-r16 BOOLEAN,

anr-ReportReq-r16 BOOLEAN,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

| *UEInformationRequest-NB* field descriptions |
| --- |
| ***anr-ReportReq***  Indicates whether the UE shall report, if available, ANR measurement information. |
| ***rach-ReportReq***  Indicates whether the UE shall report, if available, information about the random access procedure. |
| ***rlf-ReportReq***  Indicates whether the UE shall report, if available, information about radio link failure. |

#### – *UEInformationResponse-NB*

The *UEInformationResponse-NB* message is used by the UE to transfer the information requested by the E-UTRAN.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E-UTRAN

*UEInformationResponse-NB message*

-- ASN1START

UEInformationResponse-NB-r16 ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

ueInformationResponse-r16 UEInformationResponse-NB-r16-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

UEInformationResponse-NB-r16-IEs ::= SEQUENCE {

rach-Report-r16 RACH-Report-NB-r16 OPTIONAL,

rlf-Report-r16 RLF-Report-NB-r16 OPTIONAL,

anr-MeasReport-r16 ANR-MeasReport-NB-r16 OPTIONAL,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

RACH-Report-NB-r16 ::= SEQUENCE {

numberOfPreamblesSent-r16 INTEGER (1..64),

contentionDetected-r16 BOOLEAN,

initialNRSRP-Level-r16 INTEGER (0..2),

edt-Fallback-r16 BOOLEAN

}

RLF-Report-NB-r16 ::= SEQUENCE {

failedPCellId-r16 CellGlobalIdEUTRA,

reestablishmentCellId-r16 CellGlobalIdEUTRA OPTIONAL,

locationInfo-r16 LocationInfo-r10 OPTIONAL,

measResultLastServCell-r16 SEQUENCE {

nrsrpResult-r16 NRSRP-Range-NB-r14,

nrsrqResult-r16 NRSRQ-Range-NB-r14 OPTIONAL

},

timeSinceFailure-r16 TimeSinceFailure-r11 OPTIONAL

}

-- ASN1STOP

| *UEInformationResponse-NB* field descriptions |
| --- |
| ***anr-MeasReport***  Indicates the ANR measurement information. |
| ***contentionDetected***  Value TRUE indicates that contention was detected for at least one of the transmitted preambles, see TS 36.321 [6]. |
| ***edt-Fallback***  Value TRUE indicates that EDT fallback indication was received from the lower layers, see TS 36.321 [6]. |
| ***failedPCellId***  Indicates the PCell in which RLF is detected. |
| ***initialNRSRP-Level***  Indicates the NRSRP level of the NPRACH resource selected for the first preamble transmission. |
| ***measResultLastServCell***  Refers to the last measurement results taken in the PCell, where radio link failure happened. |
| ***numberOfPreamblesSent***  Indicates the number of RACH preambles that were transmitted. Corresponds to parameter PREAMBLE\_TRANSMISSION\_COUNTER in TS 36.321 [6]. |
| ***reestablishmentCellId***  Indicates the cell in which the re-establishment attempt was made after connection failure. |
| ***timeSinceFailure***  Indicates the time that elapsed since the connection failure. Value in seconds. The maximum value 172800 means 172800s or longer. |

#### – *ULInformationTransfer-NB*

The *ULInformationTransfer-NB* message is used for the uplink transfer of NAS information.

Signalling radio bearer: SRB1 or SRB1bis

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E‑UTRAN

*ULInformationTransfer-NB* message

-- ASN1START

ULInformationTransfer-NB ::= SEQUENCE {

criticalExtensions CHOICE {

ulInformationTransfer-r13 ULInformationTransfer-NB-r13-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

ULInformationTransfer-NB-r13-IEs ::= SEQUENCE {

dedicatedInfoNAS-r13 DedicatedInfoNAS,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- ASN1STOP

### 6.7.3 NB-IoT information elements

#### 6.7.3.1 NB-IoT System information blocks

#### – *SystemInformationBlockType2-NB*

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

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

*SystemInformationBlockType2-NB* information element

-- ASN1START

SystemInformationBlockType2-NB-r13 ::= SEQUENCE {

radioResourceConfigCommon-r13 RadioResourceConfigCommonSIB-NB-r13,

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

freqInfo-r13 SEQUENCE {

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

additionalSpectrumEmission-r13 AdditionalSpectrumEmission

},

timeAlignmentTimerCommon-r13 TimeAlignmentTimer,

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

lateNonCriticalExtension OCTET STRING OPTIONAL,

...,

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

]],

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

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

]],

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

freqInfo-v1530 SEQUENCE {

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

} OPTIONAL, -- Cond TDD

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

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

]],

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

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

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

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

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

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

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

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

]]

}

-- ASN1STOP

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

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

#### – *SystemInformationBlockType3-NB*

The IE *SystemInformationBlockType3-NB* contains cell re-selection information common for intra-frequency, and inter-frequency cell re-selection as well as intra-frequency cell re-selection information other than neighbouring cell related.

*SystemInformationBlockType3-NB* information element

-- ASN1START

SystemInformationBlockType3-NB-r13 ::= SEQUENCE {

cellReselectionInfoCommon-r13 SEQUENCE {

q-Hyst-r13 ENUMERATED {

dB0, dB1, dB2, dB3, dB4, dB5, dB6, dB8, dB10,

dB12, dB14, dB16, dB18, dB20, dB22, dB24

}

},

cellReselectionServingFreqInfo-r13 SEQUENCE {

s-NonIntraSearch-r13 ReselectionThreshold

},

intraFreqCellReselectionInfo-r13 SEQUENCE {

q-RxLevMin-r13 Q-RxLevMin,

q-QualMin-r13 Q-QualMin-r9 OPTIONAL, -- Need OP

p-Max-r13 P-Max OPTIONAL, -- Need OP

s-IntraSearchP-r13 ReselectionThreshold,

t-Reselection-r13 T-Reselection-NB-r13

},

freqBandInfo-r13 NS-PmaxList-NB-r13 OPTIONAL, -- Need OR

multiBandInfoList-r13 SEQUENCE (SIZE (1..maxMultiBands)) OF

NS-PmaxList-NB-r13 OPTIONAL, -- Need OR

lateNonCriticalExtension OCTET STRING OPTIONAL,

...,

[[ intraFreqCellReselectionInfo-v1350 IntraFreqCellReselectionInfo-NB-v1350 OPTIONAL -- Cond Qrxlevmin

]],

[[ intraFreqCellReselectionInfo-v1360 IntraFreqCellReselectionInfo-NB-v1360 OPTIONAL -- Need OR

]],

[[ intraFreqCellReselectionInfo-v1430 IntraFreqCellReselectionInfo-NB-v1430 OPTIONAL -- Need OR

]],

[[ cellReselectionInfoCommon-v1450 CellReselectionInfoCommon-NB-v1450 OPTIONAL -- Need OR

]],

[[ nsss-RRM-Config-r15 NSSS-RRM-Config-NB-r15 OPTIONAL, -- Need OR

npbch-RRM-Config-r15 ENUMERATED {enabled} OPTIONAL -- Need OR

]],

[[ connMeasConfig-r17 ConnMeasConfig-NB-r17 OPTIONAL, -- Need OR

t-Service-r17 TimeOffsetUTC-r17 OPTIONAL -- Need OR

]]

}

IntraFreqCellReselectionInfo-NB-v1350 ::= SEQUENCE {

delta-RxLevMin-v1350 INTEGER (-8..-1)

}

IntraFreqCellReselectionInfo-NB-v1360 ::= SEQUENCE {

s-IntraSearchP-v1360 ReselectionThreshold-NB-v1360

}

IntraFreqCellReselectionInfo-NB-v1430 ::= SEQUENCE {

powerClass14dBm-Offset-r14 ENUMERATED {dB-6, dB-3, dB3, dB6, dB9, dB12} OPTIONAL, -- Need OP

ce-AuthorisationOffset-r14 ENUMERATED {dB5, dB10, dB15, dB20, dB25, dB30, dB35} OPTIONAL -- Need OP

}

CellReselectionInfoCommon-NB-v1450 ::= SEQUENCE {

s-SearchDeltaP-r14 ENUMERATED {dB6, dB9, dB12, dB15}

}

ConnMeasConfig-NB-r17 ::= SEQUENCE {

s-MeasureIntra-r17 NRSRP-Range-NB-r14,

s-MeasureInter-r17 NRSRP-Range-NB-r14 OPTIONAL, -- Need OP

neighCellMeasCriteria-r17 SEQUENCE {

s-MeasureDeltaP-r17 ENUMERATED {dB6, dB9, dB12, dB15},

t-MeasureDeltaP-r17 ENUMERATED {s15, s30, s45, s60}

} OPTIONAL -- Need OR

}

-- ASN1STOP

| *SystemInformationBlockType3-NB* field descriptions |
| --- |
| ***ce-AuthorisationOffset***  Parameter "Qoffsetauthorization" in TS 36.304 [4]. Value in dB. Value dB5 corresponds to 5 dB, dB10 corresponds to 10 dB and so on.  If the field is absent, the UE applies the value of ce-*authorisationOffset* in *SystemInformationBlockType1-NB*. |
| ***multiBandInfoList***  A list of *additionalPmax* and *additionalSpectrumEmission* values as defined in TS 36.101 [42], clause 6.2.4F, applicable for the intra-frequency neighbouring NB-IoT cells if the UE selects the frequency band from *freqBandIndicator* in *SystemInformationBlockType1-NB*. |
| ***npbch-RRM-Config***  For FDD: Configuration for NPBCH-based RRM measurements. See TS 36.214 [24].  If enabled, NPBCH can be used in addition to NRS for RRM measurements for serving cell. |
| ***nsss-RRM-Config***  For FDD: Configuration for NSSS-based RRM measurements for the serving cell. |
| ***powerClass14dBm-Offset***  Parameter "Poffset" in TS 36.304 [4], only applicable for UE supporting *powerClassNB-14dBm*. Value in dB. Value dB-6 corresponds to -6 dB, dB-3 corresponds to -3 dB and so on. If the field is absent, the UE applies the (default) value of 0 dB for "Poffset" in TS 36.304 [4]. |
| ***p-Max***  Value applicable for the intra-frequency neighbouring E-UTRA cells. If absent the UE applies the maximum power according to the UE capability. |
| ***q-Hyst***  Parameter *Qhyst* in TS 36.304 [4], Value in dB. Value dB1 corresponds to 1 dB, dB2 corresponds to 2 dB and so on. |
| ***q-QualMin***  Parameter "Qqualmin" in TS 36.304 [4], applicable for intra-frequency neighbour cells. If the field is not present, the UE applies the (default) value of negative infinity for Qqualmin. |
| ***q-RxLevMin, delta-RxLevMin***  Parameter "Qrxlevmin" in TS 36.304 [4], applicable for intra-frequency neighbour cells. If *delta-RxLevMin* is not included, actual value Qrxlevmin = *q-RxLevMin* \* 2 [dBm]. If *delta-RxLevMin* is included, actual value Qrxlevmin = (*q-RxLevMin* + *delta-RxLevMin*) \* 2 [dBm]. |
| ***s-IntraSearchP***  Parameter "SIntraSearchP" in TS 36.304 [4].  In case *s-IntraSearchP-v1360* is included, the UE shall ignore *s-IntraSearchP* (i.e. without suffix). |
| ***s-MeasureDeltaP***  Threshold of change in serving cell NRSRP to trigger neighbour cell measurement in RRC\_CONNECTED state. |
| ***s-MeasureInter***  NRSRP threshold to trigger inter-frequency neighbour cell measurement in RRC\_CONNECTED state. |
| ***s-MeasureIntra***  NRSRP threshold to trigger intra-frequency neighbour cell measurement in RRC\_CONNECTED state. |
| ***s-NonIntraSearch***  Parameter "SnonIntraSearchP" in TS 36.304 [4]. |
| ***s-SearchDeltaP***  Parameter "SSearchDeltaP" in TS 36.304 [4]. This parameter is only applicable for UEs supporting relaxed monitoring as specified in TS 36.306 [5]. Value dB6 corresponds to 6 dB, dB9 corresponds to 9 dB and so on. |
| ***t-MeasureDeltaP***  Duration after which the UE is not required to perfom neighbour cell measurement in RRC\_CONNECTED when *s-MeasureDeltaP* criterion is fulfilled. |
| ***t-Reselection***  Parameter "TreselectionNB-IoT\_Intra" in TS 36.304 [4]. |
| ***t-Service***  Time information on when a NTN quasi-Earth fixed cell is going to stop serving the area it is currently covering. |

| Conditional presence | Explanation |
| --- | --- |
| Qrxlevmin | This field is optionally present, Need OR, if *q-RxLevMin* is set to the minimum value. Otherwise the field is not present. |

#### – *SystemInformationBlockType4-NB*

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

*SystemInformationBlockType4-NB* information element

-- ASN1START

SystemInformationBlockType4-NB-r13 ::= SEQUENCE {

intraFreqNeighCellList-r13 IntraFreqNeighCellList OPTIONAL, -- Need OR

intraFreqExcludedCellList-r13 IntraFreqExcludedCellList OPTIONAL, -- Need OR

lateNonCriticalExtension OCTET STRING OPTIONAL,

...,

[[ nsss-RRM-Config-r15 NSSS-RRM-Config-NB-r15 OPTIONAL, -- Need OR

intraFreqNeighCellList-v1530 IntraFreqNeighCellList-NB-v1530 OPTIONAL -- Need OR

]]

}

IntraFreqNeighCellList-NB-v1530 ::= SEQUENCE (SIZE (1..maxCellIntra)) OF IntraFreqNeighCellInfo-NB-v1530

IntraFreqNeighCellInfo-NB-v1530 ::= SEQUENCE {

nsss-RRM-Config-r15 NSSS-RRM-Config-NB-r15 OPTIONAL -- Cond NSSS-RRM

}

-- ASN1STOP

| *SystemInformationBlockType4-NB* field descriptions |
| --- |
| ***intraFreqExcludedCellList***  List of exclude-listed intra-frequency neighbouring cells. |
| ***intraFreqNeighCellList***  List of intra-frequency neighbouring cells with specific cell re-selection parameters. |
| ***nsss-RRM-Config***  For FDD: Configuration for NSSS-based RRM measurements.  If *intraFreqNeighCellList-NB-v1530* is present then for a cell which is included in *intraFreqNeighCellList*, the UE applies the *nsss-RRM-Config* configured in the corresponding entry of *IntraFreqNeighCellList-NB-v1530*. Otherwise, the UE applies the *nsss-RRM-Config* configured in *SystemInformationBlockType4-NB-r13*. |

| Conditional presence | Explanation |
| --- | --- |
| *NSSS-RRM* | This field is optionally present, Need OR, when *nsss-RRM-Config* is present in *SystemInformationBlockType4-NB*. Otherwise, the field is not present, and the UE shall delete any existing value for this field. |

#### – *SystemInformationBlockType5-NB*

The IE *SystemInformationBlockType5-NB* contains information relevant only for inter-frequency cell re-selection i.e. information about other NB-IoT 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-NB* information element

-- ASN1START

SystemInformationBlockType5-NB-r13 ::= SEQUENCE {

interFreqCarrierFreqList-r13 InterFreqCarrierFreqList-NB-r13,

t-Reselection-r13 T-Reselection-NB-r13,

lateNonCriticalExtension OCTET STRING OPTIONAL,

...,

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

]]

}

InterFreqCarrierFreqList-NB-r13 ::= SEQUENCE (SIZE (1..maxFreq)) OF InterFreqCarrierFreqInfo-NB-r13

InterFreqCarrierFreqInfo-NB-r13 ::= SEQUENCE {

dl-CarrierFreq-r13 CarrierFreq-NB-r13,

q-RxLevMin-r13 Q-RxLevMin,

q-QualMin-r13 Q-QualMin-r9 OPTIONAL, -- Need OP

p-Max-r13 P-Max OPTIONAL, -- Need OP

q-OffsetFreq-r13 Q-OffsetRange DEFAULT dB0,

interFreqNeighCellList-r13 InterFreqNeighCellList-NB-r13 OPTIONAL, -- Need OR

interFreqExcludedCellList-r13 InterFreqExcludedCellList-NB-r13 OPTIONAL, -- Need OR

multiBandInfoList-r13 MultiBandInfoList-NB-r13 OPTIONAL, -- Need OR

...,

[[ delta-RxLevMin-v1350 INTEGER (-8..-1) OPTIONAL -- Cond Qrxlevmin

]],

[[ powerClass14dBm-Offset-r14 ENUMERATED {dB-6, dB-3, dB3, dB6, dB9, dB12}

OPTIONAL, -- Need OP

ce-AuthorisationOffset-r14 ENUMERATED {dB5, dB10, dB15, dB20, dB25, dB30, dB35} OPTIONAL -- Need OP

]],

[[ nsss-RRM-Config-r15 NSSS-RRM-Config-NB-r15 OPTIONAL, -- Need OR

interFreqNeighCellList-v1530 InterFreqNeighCellList-NB-v1530 OPTIONAL -- Need OR

]],

[[ dl-CarrierFreq-v1550 CarrierFreq-NB-v1550 OPTIONAL -- Cond TDD

]]

}

InterFreqNeighCellList-NB-r13 ::= SEQUENCE (SIZE (1..maxCellInter)) OF PhysCellId

InterFreqNeighCellList-NB-v1530 ::= SEQUENCE (SIZE (1..maxCellInter)) OF InterFreqNeighCellInfo-NB-v1530

InterFreqNeighCellInfo-NB-v1530 ::= SEQUENCE {

nsss-RRM-Config-r15 NSSS-RRM-Config-NB-r15 OPTIONAL -- Cond NSSS-RRM

}

InterFreqExcludedCellList-NB-r13 ::= SEQUENCE (SIZE (1..maxExcludedCell)) OF PhysCellId

-- ASN1STOP

| *SystemInformationBlockType5-NB* field descriptions |
| --- |
| ***ce-AuthorisationOffset***  Parameter "Qoffsetauthorization" in TS 36.304 [4]. Value in dB. Value dB5 corresponds to 5 dB, dB10 corresponds to 10 dB and so on. If the field is absent, the UE applies the value of ce-*authorisationOffset* in *SystemInformationBlockType1-NB*. |
| ***interFreqExcludedCellList***  List of exclude-listed 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. |
| ***interFreqNeighCellList***  List of inter-frequency neighbouring cells. E-UTRAN may include *interFreqNeighCellList* when including *InterFreqNeighCellList-NB-v1530* to provide cell specific NSSS-based measurement configuration. The UE that does not support NSSS-based RRM measurements shall ignore this field in this version of the specification. |
| ***multiBandInfoList***  Indicates the list of frequency bands, with the associated *additionalPmax* and *additionalSpectrumEmission* values as defined in TS 36.101 [42], clause 6.2.4, in addition to the band represented by dl-CarrierFreq for which cell reselection parameters are common. |
| ***nsss-RRM-Config***  For FDD: Configuration for NSSS-based RRM measurements.  If *InterFreqNeighCellList-NB-v1530* is present then for a cell which is included in *interFreqNeighCellList*, the UE applies the *nsss-RRM-Config* configured in the corresponding entry of *InterFreqNeighCellList-NB-v1530*. Otherwise, the UE applies the *nsss-RRM-Config* configured in *InterFreqCarrierFreqInfo*. |
| ***p-Max***  Value applicable for the neighbouring NB-IoT cells on this carrier frequency. If absent the UE applies the maximum power according to the UE capability. |
| ***powerClass14dBm-Offset***  Parameter "Poffset" in TS 36.304 [4], only applicable for UE supporting *powerClassNB-14dBm*. Value in dB. Value dB-6 corresponds to -6 dB, dB-3 corresponds to -3 dB and so on. If the field is absent, the UE applies the (default) value of 0 dB for "Poffset" 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. |
| ***q-RxlevMin, delta-RxLevMin***  Parameter "QRxLevmin" in TS 36.304 [4]. If *delta-RxLevMin* is not included, actual value Qrxlevmin = *q-RxLevMin* \* 2 [dBm]. If *delta-RxLevMin* is included, actual value Qrxlevmin = (*q-RxLevMin* + *delta-RxLevMin*) \* 2 [dBm]. |
| ***scptm-FreqOffset***  Parameter QoffsetSCPTM in TS 36.304 [4]. Actual value QoffsetSCPTM = field value \* 2 [dB].  If the field is absent, the UE uses infinite dBs for the SC-PTM frequency offset with cell ranking as specified in TS 36.304 [4]. |
| ***t-Reselection***  Parameter "TreselectionNB-IoT\_Inter" in TS 36.304 [4]. |

| Conditional presence | Explanation |
| --- | --- |
| *NSSS-RRM* | This field is optionally present, Need OR, when *nsss-RRM-Config* is present in *InterFreqCarrierFreqInfo*. Otherwise, the field is not present, and the UE shall delete any existing value for this field. |
| *Qrxlevmin* | This field is optionally present, Need OR, if *q-RxLevMin* is set to the minimum value. Otherwise the field is not present. |
| *TDD* | The field is optionally present, Need OR, in TDD. Otherwise, the field is not present. |

#### – *SystemInformationBlockType14-NB*

The IE *SystemInformationBlockType14-NB* contains the AB parameters for EPC and 5GC.

*SystemInformationBlockType14-NB* information element

-- ASN1START

SystemInformationBlockType14-NB-r13 ::= SEQUENCE {

ab-Param-r13 CHOICE {

ab-Common-r13 AB-Config-NB-r13,

ab-PerPLMN-List-r13 SEQUENCE (SIZE (1..maxPLMN-r11)) OF AB-ConfigPLMN-NB-r13

} OPTIONAL, -- Need OR

lateNonCriticalExtension OCTET STRING OPTIONAL,

...,

[[ ab-PerNRSRP-r15 ENUMERATED {thresh1, thresh2} OPTIONAL -- Need OR

]],

[[ uac-Param-r16 UAC-Param-NB-r16 OPTIONAL -- Need OR

]]

}

AB-ConfigPLMN-NB-r13 ::= SEQUENCE {

ab-Config-r13 AB-Config-NB-r13 OPTIONAL -- Need OR

}

AB-Config-NB-r13 ::= SEQUENCE {

ab-Category-r13 ENUMERATED {a, b, c},

ab-BarringBitmap-r13 BIT STRING (SIZE(10)),

ab-BarringForExceptionData-r13 ENUMERATED {true} OPTIONAL, -- Need OP

ab-BarringForSpecialAC-r13 BIT STRING (SIZE(5))

}

UAC-Param-NB-r16 ::= CHOICE {

uac-BarringCommon UAC-Barring-NB-r16,

uac-BarringPerPLMN-List SEQUENCE (SIZE (1..maxPLMN-r11)) OF UAC-Barring-NB-r16

}

UAC-Barring-NB-r16 ::= SEQUENCE {

uac-BarringPerCatList-r16 UAC-BarringPerCatList-NB-r16 OPTIONAL, -- Need OR

uac-AC1-SelectAssistInfo-r16 UAC-AC1-SelectAssistInfo-r15 OPTIONAL, -- Need OR

uac-BarringForAccessIdentity-r16 BIT STRING (SIZE(7))

}

UAC-BarringPerCatList-NB-r16 ::= SEQUENCE (SIZE (1..maxAccessCat-1-r15)) OF UAC-BarringPerCat-NB-r16

UAC-BarringPerCat-NB-r16 ::= SEQUENCE {

uac-accessCategory-r16 INTEGER (1..maxAccessCat-1-r15),

uac-BarringFactor-r16 ENUMERATED {p00, p05, p10, p15, p20, p25, p30, p40,

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

uac-BarringTime-r16 ENUMERATED {s4, s8, s16, s32, s64, s128, s256, s512}

}

-- ASN1STOP

| *SystemInformationBlockType14-NB* field descriptions |
| --- |
| ***ab-BarringBitmap***  Access class barring for AC 0-9. The first/ leftmost bit is for AC 0, the second bit is for AC 1, and so on. |
| ***ab-BarringForExceptionData***  Indicates whether ExceptionData is subject to access barring. |
| ***ab-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. |
| ***ab-Category***  Indicates the category of UEs for which AB applies. Value *a* corresponds to all UEs, value *b* corresponds to the UEs that are neither in their HPLMN nor in a PLMN that is equivalent to it, and value *c* corresponds to the UEs that are neither in the PLMN listed as most preferred PLMN of the country where the UEs are roaming in the operator-defined PLMN selector list on the USIM, nor in their HPLMN nor in a PLMN that is equivalent to their HPLMN, see TS 22.011 [10]. |
| ***ab-Common***  The AB parameters applicable for all PLMN(s). |
| ***ab-Param***  The AB parameters for connectivity to EPC |
| ***ab-PerNRSRP***  Access barring per NRSRP. Value *thresh1* corresponds to the first entry configured in *rsrp-ThresholdsPrachInfoList,* value *thresh2* corresponds to the second entry configured in *rsrp-ThresholdsPrachInfoList*. |
| ***ab-PerPLMN-List***  The AB parameters per PLMN, listed in the same order as the PLMN(s) occur in *plmn-IdentityList* in *SystemInformationBlockType1-NB*. |
| ***uac-AC1-SelectAssistInfo***  Information used to determine whether Access Category 1 applies to the UE, as defined in TS 22.261 [96]. The field is forwarded to upper layers, if present. |
| ***uac-accessCategory***  The Access Category according to TS 22.261 [96]. |
| ***uac-BarringCommon***  The UAC parameters applicable for all PLMN(s). |
| ***uac-BarringFactor***  Represents the probability that access attempt would be allowed during access barring check. |
| ***uac-BarringForAccessIdentity***  Indicates whether access attempt is allowed for each Access Identity. The leftmost bit, bit 0 in the bit string corresponds to Access Identity 1, bit 1 in the bit string corresponds to Access Identity 2, bit 2 in the bit string corresponds to Access Identity 11, bit 3 in the bit string corresponds to Access Identity 12, and so on. Value 0 means that access attempt is allowed for the corresponding access identity. |
| ***uac-BarringPerCatList***  Access control parameters for each access category for the specific PLMN. |
| ***uac-BarringPerPLMN-List***  The UAC parameters per PLMN, listed in the same order as the PLMN(s) occur in *plmn-IdentityList* in *SystemInformationBlockType1-NB*. |
| ***uac-BarringTime***  The average time in seconds before a new access attempt is to be performed after an access attempt was barred at access barring check for the same access category, see 5.3.16.5. |
| ***uac-Param***  The UAC parameters for connectivity to 5GC. |

#### – *SystemInformationBlockType15-NB*

The IE *SystemInformationBlockType15-NB* contains the MBMS Service Area Identities (SAI) of the current and/ or neighbouring carrier frequencies.

*SystemInformationBlockType15-NB* information element

-- ASN1START

SystemInformationBlockType15-NB-r14 ::= SEQUENCE {

mbms-SAI-IntraFreq-r14 MBMS-SAI-List-r11 OPTIONAL, -- Need OR

mbms-SAI-InterFreqList-r14 MBMS-SAI-InterFreqList-NB-r14 OPTIONAL, -- Need OR

lateNonCriticalExtension OCTET STRING OPTIONAL,

...

}

MBMS-SAI-InterFreqList-NB-r14 ::= SEQUENCE (SIZE (1..maxFreq)) OF MBMS-SAI-InterFreq-NB-r14

MBMS-SAI-InterFreq-NB-r14 ::= SEQUENCE {

dl-CarrierFreq-r14 CarrierFreq-NB-r13,

mbms-SAI-List-r14 MBMS-SAI-List-r11,

multiBandInfoList-r14 AdditionalBandInfoList-NB-r14 OPTIONAL -- Need OR

}

-- ASN1STOP

| *SystemInformationBlockType15-NB* field descriptions |
| --- |
| ***mbms-SAI-InterFreqList***  Contains a list of neighboring frequencies including additional frequency bands, if any, that provide MBMS services and the corresponding MBMS SAIs. |
| ***mbms-SAI-IntraFreq***  Contains the list of MBMS SAIs for the current frequency. A duplicate MBMS SAI indicates that this and all following SAIs are not offered by this cell but only by neighbour cells on the current frequency. For MBMS service continuity, the UE shall use all MBMS SAIs listed in *mbms-SAI-IntraFreq* to derive the MBMS frequencies of interest. |
| ***mbms-SAI-List***  Contains a list of MBMS SAIs for a specific frequency. |
| ***multiBandInfoList***  A list of additional frequency bands applicable for the cells participating in the SC-PTM transmission. |

#### – *SystemInformationBlockType16-NB*

The IE *SystemInformationBlockType16-NB* contains information related to GPS time and Coordinated Universal Time (UTC). The UE may use the parameters provided in this system information block to obtain the UTC, the GPS and the local time.

-- ASN1START

SystemInformationBlockType16-NB-r13 ::= SystemInformationBlockType16-r11

-- ASN1STOP

#### – *SystemInformationBlockType20-NB*

For FDD, the IE *SystemInformationBlockType20-NB* contains the information required to acquire the control information associated with transmission of MBMS using SC-PTM.

*SystemInformationBlockType20-NB* information element

-- ASN1START

SystemInformationBlockType20-NB-r14 ::= SEQUENCE {

npdcch-SC-MCCH-Config-r14 NPDCCH-SC-MCCH-Config-NB-r14,

sc-mcch-CarrierConfig-r14 CHOICE {

dl-CarrierConfig-r14 DL-CarrierConfigCommon-NB-r14,

dl-CarrierIndex-r14 INTEGER (0.. maxNonAnchorCarriers-NB-r14)

},

sc-mcch-RepetitionPeriod-r14 ENUMERATED {rf32, rf128, rf512, rf1024,

rf2048, rf4096, rf8192, rf16384},

sc-mcch-Offset-r14 INTEGER (0..10),

sc-mcch-ModificationPeriod-r14 ENUMERATED { rf32, rf128, rf256, rf512, rf1024,

rf2048, rf4096, rf8192, rf16384, rf32768,

rf65536, rf131072, rf262144, rf524288,

rf1048576, spare1},

sc-mcch-SchedulingInfo-r14 SC-MCCH-SchedulingInfo-NB-r14 OPTIONAL, -- Need OP

lateNonCriticalExtension OCTET STRING OPTIONAL,

...

}

NPDCCH-SC-MCCH-Config-NB-r14 ::= SEQUENCE {

npdcch-NumRepetitions-SC-MCCH-r14 ENUMERATED {r1, r2, r4, r8, r16,

r32, r64, r128, r256,

r512, r1024, r2048},

npdcch-StartSF-SC-MCCH-r14 ENUMERATED {v1dot5, v2, v4, v8,

v16, v32, v48, v64},

npdcch-Offset-SC-MCCH-r14 ENUMERATED {zero, oneEighth, oneQuarter,

threeEighth, oneHalf, fiveEighth,

threeQuarter, sevenEighth}

}

SC-MCCH-SchedulingInfo-NB-r14::= SEQUENCE {

onDurationTimerSCPTM-r14 ENUMERATED {

pp1, pp2, pp3, pp4,

pp8, pp16, pp32, spare},

drx-InactivityTimerSCPTM-r14 ENUMERATED {

pp0, pp1, pp2, pp3,

pp4, pp8, pp16, pp32},

schedulingPeriodStartOffsetSCPTM-r14 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),

sf2048 INTEGER(0..2047),

sf4096 INTEGER(0..4095),

sf8192 INTEGER(0..8191)

},

...

}

-- ASN1STOP

| ***SystemInformationBlockType20-NB* field descriptions** |
| --- |
| ***dl-CarrierConfig***  Downlink carrier used for SC-MCCH. E-UTRAN cannot configure a downlink carrier operating in mixed operation mode. |
| ***dl-CarrierIndex***  Index to a downlink carrier signalled in system information. Value '0' corresponds to the anchor carrier, value '1' corresponds to the first entry in *dl-ConfigList* in *SystemInformationBlockType22-NB,* value'2' corresponds to the second entry in *dl-ConfigList* and so on. |
| ***drx-InactivityTimerSCPTM***  Timer for SC-MCCH reception in TS 36.321 [6]. Value in number of NPDCCH periods. Value pp1 corresponds to 1 NPDCCH period, pp2 corresponds to 2 NPDCCH periods and so on. |
| ***npdcch-NumRepetitions-SC-MCCH***  The maximum number of NPDCCH repetitions the UE needs to monitor for SC-MCCH multicast search space, see TS 36.213 [23]. |
| ***npdcch-Offset-SC-MCCH***  Fractional period offset of starting subframe for NPDCCH multicast search space for SC-MCCH, see TS 36.213 [23]. |
| ***npdcch-StartSF-SC-MCCH***  Starting subframes configuration of the NPDCCH multicast search space for SC-MCCH, see TS 36.213 [23]. |
| ***onDurationTimerSCPTM***  Timer for SC-MCCH reception in TS 36.321 [6]. Value in number of NPDCCH periods. Value pp1 corresponds to 1 NPDCCH period, pp2 corresponds to 2 NPDCCH periods and so on. |
| ***schedulingPeriodStartOffsetSCPTM***  *SCPTM-SchedulingCycle* and *SCPTM-SchedulingOffset* in TS 36.321 [6]. The value of *SCPTM-SchedulingCycle* is in number of sub-frames. Value sf10 corresponds to 10 sub-frames, sf20 corresponds to 20 sub-frames and so on. The value of *SCPTM-SchedulingOffset* is in number of sub-frames. |
| ***sc-mcch-CarrierConfig***  Downlink carrier that is used for SC-MCCH. |
| ***sc-mcch-ModificationPeriod***  Defines periodically appearing boundaries, i.e. radio frames for which (H-SFN \* 1024 +SFN) mod *sc-mcch-ModificationPeriod* = 0. The contents of different transmissions of SC-MCCH information can only be different if there is at least one such boundary in-between them. Value rf32 corresponds to 32 radio frames, value rf128 corresponds to 128 radio frames and so on. |
| ***sc-mcch-Offset***  Indicates, together with the sc-mcch-RepetitionPeriod, the boundary of the repetition period: (H-SFN \* 1024 +SFN) mod *sc-mcch-RepetitionPeriod* = sc-mcch-Offset. |
| ***sc-mcch-RepetitionPeriod***  Defines the interval between transmissions of SC-MCCH information, in radio frames. Value rf32 corresponds to 32 radio frames, rf128 corresponds to 128 radio frames and so on. |
| ***sc-mcch-SchedulingInfo***  DRX information for the SC-MCCH. If the field is absent, DRX is not used for SC-MCCH reception. |

#### – *SystemInformationBlockType22-NB*

The IE *SystemInformationBlockType22-NB* contains radio resource configuration for paging and random access procedure on non-anchor carriers.

*SystemInformationBlockType22-NB* information element

-- ASN1START

SystemInformationBlockType22-NB-r14 ::= SEQUENCE {

dl-ConfigList-r14 DL-ConfigCommonList-NB-r14 OPTIONAL, -- Need OR

ul-ConfigList-r14 UL-ConfigCommonList-NB-r14 OPTIONAL, -- Need OR

pagingWeightAnchor-r14 PagingWeight-NB-r14 OPTIONAL, -- Cond pcch-config

nprach-ProbabilityAnchorList-r14 NPRACH-ProbabilityAnchorList-NB-r14 OPTIONAL, -- Cond nprach-config

lateNonCriticalExtension OCTET STRING OPTIONAL,

...,

[[ mixedOperationModeConfig-r15 SEQUENCE {

dl-ConfigListMixed-r15 DL-ConfigCommonList-NB-r14 OPTIONAL, -- Cond dl-ConfigList

ul-ConfigListMixed-r15 UL-ConfigCommonList-NB-r14 OPTIONAL, -- Cond ul-ConfigList

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

nprach-Distribution-r15 ENUMERATED {true} OPTIONAL -- Need OR

} OPTIONAL, -- Need OR

ul-ConfigList-r15 UL-ConfigCommonListTDD-NB-r15 OPTIONAL -- Cond TDD

]],

[[ coverageBasedPagingConfig-r17 CoverageBasedPagingConfig-NB-r17 OPTIONAL -- Need OR

]]

}

DL-ConfigCommonList-NB-r14 ::= SEQUENCE (SIZE (1.. maxNonAnchorCarriers-NB-r14)) OF

DL-ConfigCommon-NB-r14

UL-ConfigCommonList-NB-r14 ::= SEQUENCE (SIZE (1.. maxNonAnchorCarriers-NB-r14)) OF

UL-ConfigCommon-NB-r14

UL-ConfigCommonListTDD-NB-r15 ::= SEQUENCE (SIZE (1.. maxNonAnchorCarriers-NB-r14)) OF

UL-ConfigCommonTDD-NB-r15

CoverageBasedPagingConfig-NB-r17 ::= SEQUENCE {

cbpc-HystTimer-r17 ENUMERATED {ms2560, ms7680, ms12800, ms17920, ms23040, ms28160, ms33280, ms40960},

cbpcg-ConfigList-r17 SEQUENCE (SIZE (1.. 2)) OF CBPCG-Config-NB-r17

}

CBPCG-Config-NB-r17 ::= SEQUENCE {

nrsrpMin-r17 RSRP-Range,

nB-r17 ENUMERATED {fourT, twoT, oneT, halfT, quarterT, one8thT, one16thT, one32ndT,

one64thT, one128thT, one256thT, one512thT, one1024thT, spare3,

spare2, spare1} OPTIONAL, -- Need OP

ue-SpecificDRX-CycleMin-r17 ENUMERATED {rf32, rf64, rf128, rf256} OPTIONAL -- Need OR

}

DL-ConfigCommon-NB-r14 ::= SEQUENCE {

dl-CarrierConfig-r14 DL-CarrierConfigCommon-NB-r14,

pcch-Config-r14 PCCH-Config-NB-r14 OPTIONAL, -- Need OR

...,

[[ wus-Config-r15 WUS-ConfigPerCarrier-NB-r15 OPTIONAL -- Cond WUS

]],

[[ gwus-Config-r16 WUS-ConfigPerCarrier-NB-r15 OPTIONAL -- Cond GWUS

]],

[[ pcch-Config-r17 PCCH-Config-NB-r17 OPTIONAL -- Cond pcch-config2

]]

}

PCCH-Config-NB-r14 ::= SEQUENCE {

npdcch-NumRepetitionPaging-r14 ENUMERATED {

r1, r2, r4, r8, r16, r32, r64, r128,

r256, r512, r1024, r2048,

spare4, spare3, spare2, spare1} OPTIONAL, -- Need OP

pagingWeight-r14 PagingWeight-NB-r14 DEFAULT w1,

...

}

PCCH-Config-NB-r17 ::= SEQUENCE {

cbpcg-Index-r17 INTEGER (1..2),

npdcch-NumRepetitionPaging-r17 ENUMERATED {r1, r2, r4, r8, r16, r32, r64, r128},

pagingWeight-r17 PagingWeight-NB-r14 DEFAULT w1,

...

}

PagingWeight-NB-r14 ::= ENUMERATED {w1, w2, w3, w4, w5, w6, w7, w8,

w9, w10, w11, w12, w13, w14, w15, w16}

UL-ConfigCommon-NB-r14 ::= SEQUENCE {

ul-CarrierFreq-r14 CarrierFreq-NB-r13,

nprach-ParametersList-r14 NPRACH-ParametersList-NB-r14 OPTIONAL, -- Need OR

...,

[[ nprach-ParametersListEDT-r15 NPRACH-ParametersList-NB-r14 OPTIONAL -- Cond EDT

]],

[[ rsrp-ThresholdsPrachInfoList-r16 RSRP-ThresholdsNPRACH-InfoList-NB-r13 OPTIONAL -- Need OR

]]

}

UL-ConfigCommonTDD-NB-r15 ::= SEQUENCE {

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

nprach-ParametersListTDD-r15 NPRACH-ParametersListTDD-NB-r15 OPTIONAL, -- Need OR

...

}

NPRACH-ProbabilityAnchorList-NB-r14 ::= SEQUENCE (SIZE (1.. maxNPRACH-Resources-NB-r13)) OF

NPRACH-ProbabilityAnchor-NB-r14

NPRACH-ProbabilityAnchor-NB-r14 ::= SEQUENCE {

nprach-ProbabilityAnchor-r14 ENUMERATED {

zero, oneSixteenth, oneFifteenth, oneFourteenth,

oneThirteenth, oneTwelfth, oneEleventh, oneTenth,

oneNinth, oneEighth, oneSeventh, oneSixth,

oneFifth, oneFourth, oneThird, oneHalf}

OPTIONAL -- Need OP

}

-- ASN1STOP

| *SystemInformationBlockType22-NB* field descriptions |
| --- |
| ***cbpc-HystTimer***  The minimum duration, in milliseconds, a UE configured with coverage-based paging carrier uses the same carrier for paging, see TS 36.304 [4]. Value *ms2560* corresponds to 2560ms, value *ms7680* corresponds to 7680ms, and so on. |
| ***cbpcg-Index***  Index to the coverage-based paging configuration associated with the downlink carrier. Value 1 corresponds to the first entry in *cbpcg-ConfigList*, value 2 corresponds to the second entry in the *cbpcg-ConfigList*. |
| ***dl-CarrierConfig***  For FDD: Provides the configuration of the DL non-anchor carrier.  For TDD: Provides the configuration of the non-anchor carrier. |
| ***dl-ConfigList, dl-ConfigListMixed***  For FDD: List of DL non-anchor carriers and associated configuration that can be used for paging and/or random access. E-UTRAN configures DL non-anchor carriers operating in mixed operation mode only in *dl-ConfigListMixed* and only a UE that supports mixed operation mode uses the carriers in *dl-ConfigListMixed*. A given carrier is either signalled in the *dl-ConfigList* or in *dl-ConfigListMixed*.  If *dl-ConfigListMixed* is present and at least one of the carriers in *dl-ConfigListMixed* is configured for paging:  - If *pagingDistribution* is present, the UE supporting mixed operation mode creates a combined list of DL carriers for paging by appending *dl-ConfigListMixed* to the *dl-ConfigList* while maintaining the order among *dl-ConfigList* and *dl-ConfigListMixed*; the total number of signalled DL non-anchor carriers cannot be more than *maxNonAnchorCarriers-NB-r14*.  - If *pagingDistribution* is absent, the UE supporting mixed operation mode uses the list of DL carriers for paging provided in *dl-ConfigListMixed* and considers *pagingWeightAncho*r being set to w0, i.e. the anchor carrier is not used*.*  Otherwise, the *pagingDistribution* field is not applicable and the UE shall ignore the value.  For TDD: List of non-anchor carriers and associated configuration that can be used for paging and/or random access. |
| ***gwus-Config***  For FDD: Carrier specific GWUS Configuration.  If both *gwus-Config* and *wus-Config* are present for the carrier, E-UTRAN configures the same value for both fields. |
| ***mixedOperationModeConfig***  For FDD: Provides the configuration of DL and UL non-anchor carriers that can be used for paging and random access by a UE that supports mixed operation mode.  For TDD: This parameter is absent. |
| ***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.  If the field is absent, the value *of nB* configured in *SystemInformationBlockType2-NB* in IE *pcch-Config* applies. |
| ***npdcch-NumRepetitionPaging***  Maximum number of repetitions for NPDCCH common search space (CSS) for paging, see TS 36.213 [23], clause 16.6.  If the field is absent, the value *of npdcch-NumRepetitionPaging* configured in *SystemInformationBlockType2-NB* in IE *pcch-Config* applies. |
| ***nprach-Distribution***  Indicates which UL carriers a UE supporting mixed operation mode uses for random access as defined in description of *ul-ConfigList, ul-ConfigListMixed*. |
| ***nprach-ParametersList, nprach-ParametersList-EDT***  Configure NPRACH parameters for each NPRACH resource on one non-anchor UL carrier. Up to three NPRACH resources can be configured on one non-anchor UL carrier. Each NPRACH resource is associated with a different number of NPRACH repetitions.  NPRACH resources in *nprach-ParametersListEDT* are used to initiateEDT. Each NPRACH resource is associated with a maximum TBS signalled in the corresponding entry of *edt-TBS-InfoList* in *SystemInformationBlockType2-NB*.  E-UTRAN includes the same number of entries, and listed in the same order, as in *nprach-ParametersList* in *SystemInformationBlockType2-NB*. |
| ***nprach-ParametersListTDD***  For TDD: Configure NPRACH parameters for each NPRACH resource on one non-anchor UL carrier. Up to three NPRACH resources can be configured on one non-anchor UL carrier. Each NPRACH resource is associated with a different number of NPRACH repetitions.  E-UTRAN includes the same number of entries in *nprach-ParametersListTDD*, and listed in the same order, as in *nprach-ParametersListTDD* in *SystemInformationBlockType2-NB*.. |
| ***nprach-ProbabilityAnchor***  Configure the selection probability for the anchor carrier NPRACH resource, see TS 36.321 [6]. Value zero corresponds to a probability of 0, oneSixteenth corresponds to the probability of 1/16, oneFifteenth corresponds to the probability of 1/15, and so on.  If the field is absent, the selection probability of the anchor carrier NPRACH resource is 1.  All non-anchor carriers NPRACH resources have equal probability between them.  If there is no NPRACH resource defined on the anchor carrier for one repetition level in *nprach-ParametersList-EDT*, (respectively *nprach-ParametersListFmt2*, *nprach-ParametersListFmt2-EDT*), the UE shall use the value 'zero' and ignore the signalled value of *nprach-ProbabilityAnchor* for this repetition level for the NPRACH resources defined by *nprach-ParametersList-EDT* (respectively *nprach-ParametersListFmt2*, *nprach-ParametersListFmt2-EDT*). |
| ***nprach-ProbabilityAnchorList***  Configures the selection probability for each NPRACH resource on the anchor carrier.  E-UTRAN includes the same number of entries, and listed in the same order, as in *nprach-ParametersList* in *SystemInformationBlockType2-NB.* |
| ***nrsrpMin***  The minimum serving cell NRSRP threshold applicable to the coverage-based paging carrier group. |
| ***pagingDistribution***  Indicates which DL carriers a UE supporting mixed operation mode monitors for paging as defined in description of *dl-ConfigList, dl-ConfigListMixed*. |
| ***pagingWeight***  Weight of the non-anchor paging carrier for uneven paging load distribution across the carriers. Value w1 corresponds to a relative weight of 1, w2 corresponds to a relative weight of 2, and so on.  The paging load for a carrier 'i' is equal to w(i)/W where i is equal to 0 for the anchor carrier and equal to the index of the carrier in the *dl-ConfigList* / *dl-ConfigListMixed* for a non-anchor carrier, W is the sum of the weights of all paging carriers.  To avoid correlation between paging carrier and paging occasion, the weights should be assigned such that: nB \* W <= 16384. |
| ***pagingWeightAnchor***  Weight of the anchor carrier for uneven paging load distribution across the carriers. Value w1 corresponds to a relative weight of 1, w2 corresponds to a relative weight of 2, and so on.  If the field is absent, the (default) value of w0 is applied, i.e. the anchor carrier is not used for paging. |
| ***pcch-Config***  Configure the PCCH parameters for the non-anchor DL carrier. |
| ***rsrp-ThresholdsPrachInfoList***  The criterion for UE to select an NPRACH resource on the non-anchor carrier. The threshold values are related to the anchor carrier NRSRP measurement. See TS 36.321 [6]. E-UTRAN includes the same number of entries, and listed in the same order, as in *rsrp-ThresholdsPrachInfoList* in *SystemInformationBlockType2-NB*.  A UE that supports *powerClassNB-14dBm-r14* shall correct the RSRP threshold values before applying them as follows:  RSRP threshold = Signalled RSRP threshold - min{0, (14-min(23, P-Max))} where P-Max*:*is the value of *p-Max* field in *SystemInformationBlockType1-NB.* |
| ***tdd-UL-DL-AlignmentOffset***  Indicates the offset between the UL carrier frequency center with respect to DL carrier frequency center for the non-anchor carrier. |
| ***ue-SpecificDRX-CycleMin***  Minimum UE specific DRX cycle for the carrier see TS 36.304 [4]. Value *rf32* corresponds to 32 radio frames, *rf64* corresponds to 64 radio frames and so on.  If present, E-UTRAN ensures PCCH configuration does not lead to CSS overlap for *ue-SpecificDRX-CycleMin*. |
| ***ul-CarrierFreq***  For FDD: UL carrier frequency of the non-anchor carrier as defined in TS 36.101 [42], clause 5.7.3F.  For TDD: This field is absent and the uplink carrier frequency is same as the downlink frequency. |
| ***ul-ConfigList, ul-ConfigListMixed***  For FDD: List of UL non-anchor carriers and associated configuration that can be used for random access. E-UTRAN configures UL non-anchor carriers operating in mixed operation mode only in *ul-ConfigListMixed* and only a UE that supports mixed operation mode uses the carriers in *ul-ConfigListMixed*. A given carrier is either signalled in the *ul-ConfigList* or in *ul-ConfigListMixed*.  If *ul-ConfigListMixed* is present and at least one of the carriers in *ul-ConfigListMixed* is configured for random access:  - If *nprach-Distribution* is present, the UE supporting mixed operation mode creates a combined list of UL carriers for random access by appending *ul-ConfigListMixed* to the *ul-ConfigList* while maintaining the order among both *ul-ConfigList* and *ul-ConfigListMixed*; the total number of signalled UL non-anchor carriers cannot be more than *maxNonAnchorCarriers-NB-r14*.  - If *nprach-Distribution* is absent, the UE supporting mixed operation mode uses the list of UL carriers for random access provided in *ul-ConfigListMixed* and considers *nprach-ProbabiliyAnchor* being set to zero for each NPRACH resource, i.e. the anchor carrier is not used for random access*.*  Otherwise, the *nprach-Distribution* field is not applicable and the UE shall ignore the value.  For TDD: E-UTRAN configures *ul-ConfigList-r15* and includes the same number of entries as in *dl-ConfigList*. The UL carrier frequency of the non-anchor carrier is same as the DL carrier frequency. |
| ***wus-Config***  For FDD: Carrier specific WUS Configuration. |

| Conditional presence | Explanation |
| --- | --- |
| *dl-ConfigList* | This field is optionally present, Need OR, if the field *dl-ConfigList* is present. Otherwise the field is not present. |
| *EDT* | The field is optionally present, Need OR, if *edt-Parameters* in *SystemInformationBlockType2-NB* is present; otherwise the field is not present and the UE shall delete any existing value for this field. |
| *GWUS* | This field is optionally present, Need OR, if g*wus-Config-r16* is present in *SystemInformationBlockType2-NB*. Otherwise the field is not present. |
| *pcch-config* | This field is optionally present, Need OP, if the field *dl-ConfigList* is present and at least one of the carriers in *dl-ConfigList* is configured for paging. Otherwise the field is not present and only the anchor carrier is used for paging. |
| *pcch-config2* | This field is optionally present, need OR, if the field *pcch-Config-r14* is not present for the same carrier and *coverageBasedPagingConfig* is present. Otherwise the field is not present and the UE shall delete any existing value for this field. |
| *nprach-config* | This field is mandatory present, if the field *ul-ConfigList* is present and at least one of the carriers in *ul-ConfigList* is configured for random access. Otherwise the field is not present and only the anchor carrier is used for random access. |
| *TDD* | This field is optionally present, Need OR, for TDD. Otherwise the field is not present. |
| *ul-ConfigList* | This field is optionally present, Need OR, if the field *ul-ConfigList* is present. Otherwise the field is not present. |
| *WUS* | This field is mandatory present, if the field *wus-Config* is present in *SystemInformationBlockType2-NB*. Otherwise the field is not present, Need OR. |

#### – *SystemInformationBlockType23-NB*

For FDD, the IE *SystemInformationBlockType23-NB* contains radio resource configuration for NPRACH resources using preamble format 2 on non-anchor carriers.

*SystemInformationBlockType23-NB* information element

-- ASN1START

SystemInformationBlockType23-NB-r15 ::= SEQUENCE {

ul-ConfigList-v1530 UL-ConfigCommonList-NB-v1530 OPTIONAL, -- Need OR

ul-ConfigListMixed-v1530 UL-ConfigCommonList-NB-v1530 OPTIONAL, -- Need OR

lateNonCriticalExtension OCTET STRING OPTIONAL,

...

}

UL-ConfigCommonList-NB-v1530 ::= SEQUENCE (SIZE (1.. maxNonAnchorCarriers-NB-r14)) OF

UL-ConfigCommon-NB-v1530

UL-ConfigCommon-NB-v1530 ::= SEQUENCE {

nprach-ParametersListFmt2-r15 NPRACH-ParametersListFmt2-NB-r15 OPTIONAL, -- Need OR

nprach-ParametersListFmt2EDT-r15 NPRACH-ParametersListFmt2-NB-r15 OPTIONAL, -- Cond EDT

...

}

-- ASN1STOP

| *SystemInformationBlockType23-NB* field descriptions |
| --- |
| ***nprach-ParametersListFmt2, nprach-ParametersListFmt2EDT***  Configures NPRACH parameters for each NPRACH resource format 2 on one UL carrier. Up to three NPRACH resources can be configured on one carrier. Each NPRACH resource is associated with a different number of NPRACH repetitions.  E-UTRAN includes the same number of entries, and listed in the same order, as in *nprach-ParametersList* in *SystemInformationBlockType2-NB*.  The NPRACH resources in *nprach-ParametersListFmt2EDT* are used to initiateEDT. Each NPRACH resource is associated with a TBS signalled in the corresponding entry of *edt-TBS-InfoList.*  E-UTRAN configures the NPRACH resources format 2 so that they do not overlap in time domain with the NPRACH resources configured in *nprach-ParametersList* and *nprach-ParametersListEDT* on the same UL carrier.  If there is no NPRACH resource in *nprach-ParametersListFmt2* (respectively *nprach-ParametersListFmt2EDT*) on any UL carrier, including the anchor carrier, for one NPRACH repetition level, the UE uses the NPRACH resources in *nprach-ParametersList* (respectively *nprach-ParametersListEDT*) for this NPRACH repetition level. Otherwise, the UE uses only NPRACH resources in *nprach-ParametersListFmt2* (respectively *nprach-ParametersListFmt2EDT*).  If E-UTRAN configures NPRACH resources format 2 in one NPRACH repetition level, the E-UTRAN configures NPRACH resources format 2 in all NPRACH repetition levels upwards. |
| ***ul-ConfigList, ul-ConfigListMixed***  *ul-ConfigList* (respectively *ul-ConfigListMixed*) is parallel to *ul-ConfigList* (respectively *ul-ConfigListMixed*) in *SystemInformationBlockType22-NB*.  E-UTRAN includes the same number of entries and in the same order in *ul-ConfigList* (respectively *ul-ConfigListMixed*) in *SystemInformationBlockType23-NB* as in *ul-ConfigList* (respectively *ul-ConfigListMixed*) in *SystemInformationBlockType22-NB.* The UE combines each entry in *ul-ConfigList* (respectively *ul-ConfigListMixed*) in *SystemInformationBlockType23-NB* with the corresponding entry in *ul-ConfigList* (respectively *ul-ConfigListMixed*) in *SystemInformationBlockType22-NB*. |

| Conditional presence | Explanation |
| --- | --- |
| *EDT* | The field is optionally present, Need OR, if *edt-Parameters* in *SystemInformationBlockType2-NB* is present; otherwise the field is not present and the UE shall delete any existing value for this field. |

#### – *SystemInformationBlockType27-NB*

The IE *SystemInformationBlockType27-NB* contains information relevant only for inter-RAT cell selection i.e. assistance information about E-UTRA frequencies and/ or GERAN frequencies for cell selection.

*SystemInformationBlockType27-NB* information element

-- ASN1START

SystemInformationBlockType27-NB-r16 ::= SEQUENCE {

carrierFreqListEUTRA-r16 CarrierFreqListEUTRA-NB-r16 OPTIONAL, -- Need OR

carrierFreqsListGERAN-r16 CarrierFreqsListGERAN-NB-r16 OPTIONAL, -- Need OR

lateNonCriticalExtension OCTET STRING OPTIONAL,

...

}

CarrierFreqListEUTRA-NB-r16 ::= SEQUENCE (SIZE (1..maxFreqEUTRA-NB-r16)) OF

CarrierFreqEUTRA-NB-r16

CarrierFreqsListGERAN-NB-r16 ::= SEQUENCE (SIZE (1..maxFreqsGERAN-NB-r16)) OF

CarrierFreqsGERAN-NB-r16

CarrierFreqEUTRA-NB-r16 ::= SEQUENCE {

carrierFreq-r16 ARFCN-ValueEUTRA-r9,

sib1-r16 ENUMERATED {supported} OPTIONAL, -- Need OR

sib1-BR-r16 ENUMERATED {supported} OPTIONAL, -- Need OR

...

}

CarrierFreqsGERAN-NB-r16 ::= SEQUENCE {

carrierFreqs-r16 CarrierFreqsGERAN,

ec-GSM-IOT-r16 ENUMERATED {supported} OPTIONAL, -- Need OR

peo-r16 ENUMERATED {supported} OPTIONAL, -- Need OR

...

}

-- ASN1STOP

| *SystemInformationBlockType27-NB* field descriptions |
| --- |
| ***carrierFreq***  E-UTRAN carrier frequency. |
| ***carrierFreqListEUTRA***  Provides a list of neighbouring E-UTRA carrier frequencies, which may be searched for neighbouring E-UTRAN cells. |
| ***carrierFreqs***  The list of GERAN carrier frequencies organised into one group of GERAN carrier frequencies. |
| ***carrierFreqsListGERAN***  Provides a list of neighbouring GERAN carrier frequencies, which may be searched for neighbouring GERAN cells. The GERAN carrier frequencies are organised in groups and the parameters are indicated per group of GERAN carrier frequencies. |
| ***ec-GSM-IOT***  Indicates that the GERAN carrier frequencies support EC-GSM-IOT. |
| ***peo***  Indicates that the GERAN carrier frequencies support Power Efficient Operation (PEO). |
| ***sib1***  Indicates that SIB1 is scheduled in the E-UTRAN cells. |
| ***sib1-BR***  Indicates that SIB1-BR is scheduled in the E-UTRAN cells. |

#### – *SystemInformationBlockType31-NB*

The IE *SystemInformationBlockType31-NB* contains satellite assistance information. *SystemInformationBlockType31-NB* is only signalled in a NTN cell.

***SystemInformationBlockType31-NB* information element**

-- ASN1START

SystemInformationBlockType31-NB-r17 ::= SEQUENCE {

servingSatelliteInfo-r17 ServingSatelliteInfo-r17,

lateNonCriticalExtension OCTET STRING OPTIONAL,

...

}

-- ASN1STOP

#### – *SystemInformationBlockType32-NB*

The IE *SystemInformationBlockType32-NB* contains satellite assistance information for prediction of discontinuous coverage. *SystemInformationBlockType32-NB* is only signalled in a NTN cell.

***SystemInformationBlockType32-NB* information element**

-- ASN1START

SystemInformationBlockType32-NB-r17 ::= SEQUENCE {

satelliteInfoList-r17 SatelliteInfoList-r17 OPTIONAL, -- Need OR

lateNonCriticalExtension OCTET STRING OPTIONAL,

...

}

-- ASN1STOP

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

#### – *CarrierConfigDedicated-NB*

The IE *CarrierConfigDedicated-NB* is used to specify a carrier in NB-IoT.

*CarrierConfigDedicated-NB* information elements

-- ASN1START

CarrierConfigDedicated-NB-r13 ::= SEQUENCE {

dl-CarrierConfig-r13 DL-CarrierConfigDedicated-NB-r13,

ul-CarrierConfig-r13 UL-CarrierConfigDedicated-NB-r13

}

DL-CarrierConfigDedicated-NB-r13 ::= SEQUENCE {

dl-CarrierFreq-r13 CarrierFreq-NB-r13,

downlinkBitmapNonAnchor-r13 CHOICE {

useNoBitmap-r13 NULL,

useAnchorBitmap-r13 NULL,

explicitBitmapConfiguration-r13 DL-Bitmap-NB-r13,

spare NULL

} OPTIONAL, -- Need ON

dl-GapNonAnchor-r13 CHOICE {

useNoGap-r13 NULL,

useAnchorGapConfig-r13 NULL,

explicitGapConfiguration-r13 DL-GapConfig-NB-r13,

spare NULL

} OPTIONAL, -- Need ON

inbandCarrierInfo-r13 SEQUENCE {

samePCI-Indicator-r13 CHOICE {

samePCI-r13 SEQUENCE {

indexToMidPRB-r13 INTEGER (-55..54)

},

differentPCI-r13 SEQUENCE {

eutra-NumCRS-Ports-r13 ENUMERATED {same, four}

}

} OPTIONAL, -- Cond anchor-guardband-or-standalone

eutraControlRegionSize-r13 ENUMERATED {n1, n2, n3}

} OPTIONAL, -- Cond non-anchor-inband

...,

[[ nrs-PowerOffsetNonAnchor-v1330 ENUMERATED {dB-12, dB-10, dB-8, dB-6,

dB-4, dB-2, dB0, dB3}

OPTIONAL -- Need ON

]],

[[ dl-GapNonAnchor-v1530 DL-GapConfig-NB-v1530 OPTIONAL -- Cond TDD1

]],

[[ dl-CarrierFreq-v1550 CarrierFreq-NB-v1550 OPTIONAL -- Cond TDD1

]]

}

UL-CarrierConfigDedicated-NB-r13 ::= SEQUENCE {

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

...,

[[ tdd-UL-DL-AlignmentOffset-r15 TDD-UL-DL-AlignmentOffset-NB-r15 OPTIONAL -- Cond TDD

]]

}

-- ASN1STOP

| *CarrierConfigDedicated-NB* field descriptions |
| --- |
| ***dl-CarrierConfig***  Downlink carrier used for all unicast transmissions. |
| ***dl-CarrierFreq***  DL carrier frequency. The downlink carrier is not in a E-UTRA PRB which contains E-UTRA PSS/SSS/PBCH. |
| ***dl-GapNonAnchor***  Downlink transmission gap configuration for the anchor/ non-anchor carrier, see TS 36.211 [21], clause 10.2.3.4.  E-UTRAN may configure *dl-GapNonAnchor-v1530* only if *dl-GapNonAnchor-r13* is set to *explicitGapConfiguration*. |
| ***downlinkBitmapNonAnchor***  For FDD: NB-IoT downlink subframe configuration for downlink transmission on the anchor/ non-anchor carrier. See TS 36.213 [23], clause 16.4.  For TDD: NB-IoT downlink, uplink and special subframes configuration for transmission on the anchor/ non-anchor carrier. See TS 36.213 [23], clause 16.4. |
| ***eutraControlRegionSize***  Indicates the control region size of the E-UTRA cell for the in-band operation mode, see TS 36.213 [23]. Unit is in number of OFDM symbols. If *operationModeInfo* in MIB-NB is set to *inband-SamePCI* or *inband-DifferentPCI*, it should be set to the value broadcast in SIB1-NB. |
| ***eutra-NumCRS-Ports***  Number of E-UTRA CRS antenna ports, either the same number of ports as NRS or 4 antenna ports. See TS 36.211 [21], TS 36.212 [22], and TS 36.213 [23]. |
| ***inbandCarrierInfo***  Provides the configuration of the anchor/ non-anchor inband carrier. If *operationModeInfo* is set to standalone in the MIB-NB, E-UTRAN only configures this field if the UE supports mixed operation mode. |
| ***indexToMidPRB***  The PRB index is signaled by offset from the middle of the EUTRA system. |
| ***nrs-PowerOffsetNonAnchor***  Provides the power offset of the downlink narrowband reference-signal EPRE of the anchor/ non-anchor carrier relative to the anchor carrier, unit in dB. Value dB-12 corresponds to -12 dB, dB-10 corresponds to -10 dB and so on. See TS 36.213 [23], clause16.2.2. |
| ***samePCI-Indicator***  This parameter specifies whether the anchor/ non-anchor carrier reuses the same PCI as the EUTRA carrier. |
| ***ul-CarrierConfig***  Uplink anchor/ non-anchor carrier used for all unicast transmissions. |
| ***ul-CarrierFreq***  For FDD: UL carrier frequency as defined in TS 36.101 [42], clause 5.7.3F. If absent, the same TX-RX frequency separation and carrier frequency offset as for the anchor carrier applies.  For TDD: This field is absent and the uplink carrier frequency is equal to the downlink frequency. |

| Conditional presence | Explanation |
| --- | --- |
| *non-anchor-inband* | The field is mandatory present if the anchor/ non-anchor carrier is an inband carrier; otherwise it is not present. |
| *anchor-guardband-or-standalone* | The field is mandatory present if *operationModeInfo* is set to *guardband* or *standalone* in the MIB; otherwise it is not present. |
| *TDD* | The field is mandatory present for TDD; otherwise the field is not present and the UE shall delete any existing value for this field. |
| *TDD1* | The field is optionally present, Need OR, for TDD; otherwise the field is not present and the UE shall delete any existing value for this field. |

#### – *CarrierFreq-NB*

The IE *CarrierFreq-NB* is used to provide the NB-IoT carrier frequency, as defined in TS 36.101 [42].

*CarrierFreq-NB* information elements

-- ASN1START

CarrierFreq-NB-r13 ::= SEQUENCE {

carrierFreq-r13 ARFCN-ValueEUTRA-r9,

carrierFreqOffset-r13 ENUMERATED {

v-10, v-9, v-8, v-7, v-6, v-5, v-4, v-3, v-2, v-1, v-0dot5,

v0, v1, v2, v3, v4, v5, v6, v7, v8, v9

} OPTIONAL -- Need ON

}

CarrierFreq-NB-v1550 ::= SEQUENCE {

carrierFreqOffset-v1550 ENUMERATED {v-8dot5, v-4dot5, v3dot5, v7dot5}

}

-- ASN1STOP

| *CarrierFreq-NB* field descriptions |
| --- |
| ***carrierFreq***  Provides the ARFCN applicable for the NB-IoT carrier frequency as defined in TS 36.101 [42], Table 5.7.3-1. |
| ***carrierFreqOffset***  Offset of the NB-IoT channel number to EARFCN as defined in TS 36.101 [42], clause 5.7.3F. Value v-10 means -10, v-9 means -9, and so on. E-UTRAN may configure the values v-8dot5, v-4dot5, v3dot5 and v7dot5 only for a carrier in a TDD band.  For TDD, the UE shall use the value signalled in *carrierFreqOffset-v1550*, if present, and ignore the value signaled in *carrierFreqOffset-r13*. |

#### *– ChannelRasterOffset-NB*

The IE *ChannelRasterOffset-NB* is used to specify the NB-IoT offset from LTE channel raster. Unit in kHz in set { -7.5, -2.5, 2.5, 7.5} See TS 36.211[21] and TS 36.213 [23].

***ChannelRasterOffset-NB* information element**

-- ASN1START

ChannelRasterOffset-NB-r13 ::= ENUMERATED {khz-7dot5, khz-2dot5, khz2dot5, khz7dot5}

-- ASN1STOP

#### – *DL-Bitmap-NB*

The IE *DL-Bitmap-NB* is used to specify the set of NB-IoT downlink subframes for downlink transmission.

*DL-Bitmap-NB* information element

-- ASN1START

DL-Bitmap-NB-r13 ::= CHOICE {

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

subframePattern40-r13 BIT STRING (SIZE (40))

}

-- ASN1STOP

| *DL-Bitmap-NB* field descriptions |
| --- |
| ***subframePattern10, subframePattern40***  For FDD: NB-IoT downlink subframe configuration over 10ms or 40ms for inband and 10ms for standalone/guardband.  For TDD: NB-IoT downlink, uplink and special subframes configuration over 10ms or 40ms for inband and 10ms for standalone/guardband.  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. |

#### – *DL-CarrierConfigCommon-NB*

The IE *DL-CarrierConfigCommon-NB is* used to specify the common configuration of a DL non-anchor carrier in NB-IoT.

*DL-CarrierConfigCommon-NB* information elements

-- ASN1START

DL-CarrierConfigCommon-NB-r14 ::= SEQUENCE {

dl-CarrierFreq-r14 CarrierFreq-NB-r13,

downlinkBitmapNonAnchor-r14 CHOICE {

useNoBitmap-r14 NULL,

useAnchorBitmap-r14 NULL,

explicitBitmapConfiguration-r14 DL-Bitmap-NB-r13

},

dl-GapNonAnchor-r14 CHOICE {

useNoGap-r14 NULL,

useAnchorGapConfig-r14 NULL,

explicitGapConfiguration-r14 DL-GapConfig-NB-r13

},

inbandCarrierInfo-r14 SEQUENCE {

samePCI-Indicator-r14 CHOICE {

samePCI-r14 SEQUENCE {

indexToMidPRB-r14 INTEGER (-55..54)

},

differentPCI-r14 SEQUENCE {

eutra-NumCRS-Ports-r14 ENUMERATED {same, four}

}

} OPTIONAL, -- Cond anchor-guardband-or-standalone

eutraControlRegionSize-r14 ENUMERATED {n1, n2, n3}

} OPTIONAL, -- Cond non-anchor-inband

nrs-PowerOffsetNonAnchor-r14 ENUMERATED {dB-12, dB-10, dB-8, dB-6,

dB-4, dB-2, dB0, dB3} DEFAULT dB0,

...,

[[ dl-GapNonAnchor-v1530 DL-GapConfig-NB-v1530 OPTIONAL -- Cond TDD

]],

[[ dl-CarrierFreq-v1550 CarrierFreq-NB-v1550 OPTIONAL -- Cond TDD

]]

}

-- ASN1STOP

| *DL-CarrierConfigCommon-NB* field descriptions |
| --- |
| ***dl-CarrierFreq***  DL carrier frequency. The downlink carrier is not in a E-UTRA PRB which contains E-UTRA PSS/SSS/PBCH. |
| ***dl-GapNonAnchor***  Downlink transmission gap configuration for the non-anchor carrier, see TS 36.211 [21], clause 10.2.3.4.  E-UTRAN may configure *dl-GapNonAnchor-v1530* only if *dl-GapNonAnchor-r14* is set to *explicitGapConfiguration*. |
| ***downlinkBitmapNonAnchor***  For FDD: NB-IoT downlink subframe configuration for downlink transmission on the non-anchor carrier. See TS 36.213 [23], clause 16.4.  For TDD: NB-IoT downlink, uplink and special subframes configuration for transmission on the anchor/ non-anchor carrier. See TS 36.213 [23], clause 16.4. |
| ***eutraControlRegionSize***  Indicates the control region size of the E-UTRA cell for the in-band operation mode, see TS 36.213 [23]. Unit is in number of OFDM symbols. If *operationModeInfo* in MIB-NB is set to *inband-SamePCI* or *inband-DifferentPCI*, it should be set to the value broadcast in SIB1-NB. |
| ***eutra-NumCRS-Ports***  Number of E-UTRA CRS antenna ports, either the same number of ports as NRS or 4 antenna ports. See TS 36.211 [21], TS 36.212 [22], and TS 36.213 [23]. |
| ***inbandCarrierInfo***  Provides the configuration of a non-anchor inband carrier. |
| ***indexToMidPRB***  The PRB index is signaled by offset from the middle of the EUTRA system. |
| ***nrs-PowerOffsetNonAnchor***  Provides the downlink narrowband reference-signal EPRE offset of the non-anchor carrier relative to the downlink narrowband reference-signal EPRE of the anchor carrier, unit in dB. Value dB-12 corresponds to -12 dB, dB-10 corresponds to -10 dB and so on. See TS 36.213 [23], clause 16.2.2. |
| ***samePCI-Indicator***  This parameter specifies whether the non-anchor carrier reuses the same PCI as the EUTRA carrier. |

| Conditional presence | Explanation |
| --- | --- |
| *non-anchor-inband* | The field is mandatory present if the non-anchor carrier is an inband carrier; otherwise it is not present. |
| *anchor-guardband-or-standalone* | The field is mandatory present, if *operationModeInfo* is set to *guardband* or *standalone* in the MIB; otherwise it is not present. |
| *TDD* | The field is optionally present, Need OR, for TDD; otherwise the field is not present and the UE shall delete any existing value for this field. |

#### – *DL-GapConfig-NB*

The IE *DL-GapConfig-NB* is used to specify the downlink gap configuration for NPDCCH and NPDSCH. Downlink gaps apply to all NPDCCH/NPDSCH transmissions except for BCCH.

*DL-GapConfig-NB* information element

-- ASN1START

DL-GapConfig-NB-r13 ::= SEQUENCE {

dl-GapThreshold-r13 ENUMERATED {n32, n64, n128, n256},

dl-GapPeriodicity-r13 ENUMERATED {sf64, sf128, sf256, sf512},

dl-GapDurationCoeff-r13 ENUMERATED {oneEighth, oneFourth, threeEighth, oneHalf}

}

DL-GapConfig-NB-v1530 ::= SEQUENCE {

dl-GapPeriodicity-v1530 ENUMERATED {sf1024}

}

-- ASN1STOP

| *DL-GapConfig-NB* field descriptions |
| --- |
| ***dl-GapDurationCoeff***  Coefficient to calculate the gap duration of a DL transmission: dl-GapDurationCoeff \* dl-GapPeriodicity, Duration in number of subframes. See TS 36.211 [21], clause 10.2.3.4. |
| ***dl-GapPeriodicity***  Periodicity of a DL transmission gap in number of subframes. See TS 36.211 [21], clause 10.2.3.4.  Value *sf64* corresponds to 64 subframes, value *sf128* corresponds to 128 subframes, value *sf256* corresponds to 256 subframes and so on. E-UTRAN may configure the value *sf64* only in FDD mode and the value *sf1024* only in TDD mode.  The UE shall use the value signalled in *dl-GapPeriodicity-v1530*, if present, and ignore the value signaled in *dl-GapPeriodicity-r13*. |
| ***dl-GapThreshold***  Threshold on the maximum number of repetitions configured for NPDCCH before application of DL transmission gap configuration. See TS 36.211 [21], clause 10.2.3.4. |

#### *– GWUS-Config-NB*

The IE G*WUS-Config-NB* is used to specify the GWUS configuration. For 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-NB information element*

-- ASN1START

GWUS-Config-NB-r16 ::= SEQUENCE {

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

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

timeParameters-r16 WUS-Config-NB-r15 OPTIONAL, -- Cond noWUSr15

resourceConfigDRX-r16 GWUS-ResourceConfig-NB-r16,

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

resourceConfig-eDRX-Long-r16 GWUS-ResourceConfig-NB-r16 OPTIONAL, -- Cond timeOffset

probThreshList-r16 GWUS-ProbThreshList-NB-r16 OPTIONAL, -- Cond probabilityBased

...

}

GWUS-ResourceConfig-NB-r16 ::= SEQUENCE {

resourcePosition-r16 ENUMERATED {primary, secondary},

numGroupsList-r16 GWUS-NumGroupsList-NB-r16 OPTIONAL, -- Need OP

groupsForServiceList-r16 GWUS-GroupsForServiceList-NB-r16

OPTIONAL -- Cond probabilityBased

}

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

GWUS-Paging-ProbThresh-NB-r16

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

GWUS-NumGroupsList-NB-r16 ::= SEQUENCE (SIZE (1..maxGWUS-Resources-NB-r16)) OF

GWUS-NumGroups-NB-r16

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

GWUS-GroupsForServiceList-NB-r16 ::= SEQUENCE (SIZE (1..maxGWUS-ProbThresholds-NB-r16)) OF

INTEGER (1..maxGWUS-Groups-1-NB-r16)

-- ASN1STOP

| *GWUS-Config-NB* field descriptions |
| --- |
| ***commonSequence***  Presence of the field indicates common WUS sequence is configured.  Value *g0* indicates common WUS sequence for the shared WUS resource is g=0, value *g126* indicates common WUS sequence for the shared WUS resource is g=126, see TS 36.211 [21]. |
| ***groupAlternation***  Presence of the field enables WUS group alternation between the two WUS resources for the gap type, see TS 36.304 [4]. |
| ***groupsForServiceList***  Number of WUS groups for each paging probability group, see TS 36.304 [4]. The first entry corresponds to the first paging probability group, second entry corresponds to the second paging probability group, and so on. E-UTRAN includes the same number of entries and in the same order in *groupsForServiceList* and *probThreshList*.  Total number of WUS groups in this list cannot be more than total number of WUS groups in *numGroupsList*. |
| ***numGroupsList***  List of WUS groups for each WUS resource, see TS 36.304 [4]. First entry corresponds to the first resource, the second entry corresponds to the second resource.  *numGroupsList* shall be present in *resourceConfigDRX*.  If *numGroupsList* is not present in *resourceconfig-eDRX-Short*, parameters for DRX WUS resource applies for short eDRX WUS resource.  If *numGroupsList* is not present in *resourceConfig-eDRX-Long*, parameters for 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. |
| ***resourcePosition***  Indicates the position of the WUS resource corresponding to the first entry in *numGroupsList.*  Value *primary* indicates that the end of the WUS resource is defined by the timeoffset value for the corresponding gap type, value *secondary* indicates that the end of the WUS resource is immediately before the WUS resource configured by *wus-Config*.  E-UTRAN may only configure *secondary* when only one entry exists in *numGroupsList* and *wus-Config* is present in *SystemInformationBlockType2-NB*.  If two entries exist in *numGroupsList*, the position for the second WUS resource corresponds to value *secondary*. |
| ***timeParameters***  Time domain WUS configuration information. For individual field descriptions, see *WUS-Config-NB.* If the field is absent, the parameters in *wus-Config* apply. |

|  |  |
| --- | --- |
| Conditional presence | Explanation |
| *noWUSr15* | The field is mandatory present if *wus-Config-r15* is not present in *SystemInformationBlockType2-NB*; otherwise the field is not present. |
| *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. |

#### – *LogicalChannelConfig-NB*

The IE *LogicalChannelConfig-NB* is used to configure the logical channel parameters.

*LogicalChannelConfig-NB* information element

-- ASN1START

LogicalChannelConfig-NB-r13 ::= SEQUENCE {

priority-r13 INTEGER (1..16) OPTIONAL, -- Cond UL

logicalChannelSR-Prohibit-r13 BOOLEAN OPTIONAL, -- Need ON

...

}

-- ASN1STOP

| *LogicalChannelConfig-NB* field descriptions |
| --- |
| ***logicalChannelSR-Prohibit***  Value *TRUE* indicates that the *logicalChannelSR-ProhibitTimer* is enabled for the logical channel. If *logicalChannelSR-Prohibit* is configured (i.e. indicates value *TRUE*), E-UTRAN also configures *logicalChannelSR-ProhibitTimer*. See TS 36.321 [6]. |
| ***priority***  Logical channel priority in TS 36.321 [6]. Value is an integer. |

| Conditional presence | Explanation |
| --- | --- |
| *UL* | The field is mandatory present for UL logical channels; otherwise it is not present. |

#### – *MAC-MainConfig-NB*

The IE *MAC-MainConfig-NB* is used to specify the MAC main configuration for signalling and data radio bearers.

*MAC-MainConfig-NB* information element

-- ASN1START

MAC-MainConfig-NB-r13 ::= SEQUENCE {

ul-SCH-Config-r13 SEQUENCE {

periodicBSR-Timer-r13 PeriodicBSR-Timer-NB-r13 OPTIONAL, -- Need ON

retxBSR-Timer-r13 RetxBSR-Timer-NB-r13

} OPTIONAL, -- Need ON

drx-Config-r13 DRX-Config-NB-r13 OPTIONAL, -- Need ON

timeAlignmentTimerDedicated-r13 TimeAlignmentTimer,

logicalChannelSR-Config-r13 CHOICE {

release NULL,

setup SEQUENCE {

logicalChannelSR-ProhibitTimer-r13 ENUMERATED {

pp2, pp8, pp32, pp128, pp512,

pp1024, pp2048, spare}

}

} OPTIONAL, -- Need ON

...,

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

dataInactivityTimerConfig-r14 CHOICE {

release NULL,

setup SEQUENCE {

dataInactivityTimer-r14 DataInactivityTimer-r14

}

} OPTIONAL -- Need ON

]],

[[ drx-Cycle-v1430 ENUMERATED {

sf1280, sf2560, sf5120, sf10240} OPTIONAL -- Need ON

]],

[[ ra-CFRA-Config-r14 ENUMERATED {true} OPTIONAL -- Need ON

]],

[[ offsetThresholdTA-r17 SetupRelease {OffsetThresholdTA-NB-r17} OPTIONAL -- Need ON

]]

}

PeriodicBSR-Timer-NB-r13 ::= ENUMERATED {

pp2, pp4, pp8, pp16, pp64, pp128, infinity, spare}

RetxBSR-Timer-NB-r13 ::= ENUMERATED {

pp4, pp16, pp64, pp128, pp256, pp512, infinity, spare}

DRX-Config-NB-r13 ::= CHOICE {

release NULL,

setup SEQUENCE {

onDurationTimer-r13 ENUMERATED {

pp1, pp2, pp3, pp4, pp8, pp16, pp32, spare},

drx-InactivityTimer-r13 ENUMERATED {

pp0, pp1, pp2, pp3, pp4, pp8, pp16, pp32},

drx-RetransmissionTimer-r13 ENUMERATED {

pp0, pp1, pp2, pp4, pp6, pp8, pp16, pp24,

pp33, spare7, spare6, spare5,

spare4, spare3, spare2, spare1},

drx-Cycle-r13 ENUMERATED {

sf256, sf512, sf1024, sf1536, sf2048, sf3072,

sf4096, sf4608, sf6144, sf7680, sf8192, sf9216,

spare4, spare3, spare2, spare1},

drx-StartOffset-r13 INTEGER (0..255),

drx-ULRetransmissionTimer-r13 ENUMERATED {

pp0, pp1, pp2, pp4, pp6, pp8, pp16, pp24,

pp33, pp40, pp64, pp80, pp96,

pp112, pp128, pp160, pp320}

}

}

OffsetThresholdTA-NB-r17 ::= ENUMERATED {

ms0dot5, ms1, ms2, ms3, ms4, ms5, ms6 ,ms7,

ms8, ms9, ms10, ms11, ms12, ms13, ms14, ms15}

-- ASN1STOP

| *MAC-MainConfig*-*NB* field descriptions |
| --- |
| ***drx-Config***  Used to configure DRX as specified in TS 36.321 [6]. |
| ***drx-Cycle***  *longDRX-Cycle* in TS 36.321 [6]. The value of l*ongDRX-Cycle* is in number of sub-frames. Value sf256 corresponds to 256 sub-frames, sf512 corresponds to 512 sub-frames and so on. In case *drx-Cycle-v1430* is signalled, the UE shall ignore *drx-Cycle-r13*. |
| ***drx-StartOffset***  *drxStartOffset* in TS 36.321 [6]. Value is in number of sub-frames by step of (*drx-cycle* / 256). |
| ***drx-InactivityTimer***  Timer for DRX in TS 36.321 [6]. Value in number of PDCCH periods. Value pp0 corresponds to 0 PDCCH period and behaviour as specified in 7.3.2 applies, pp1 corresponds to 1 PDCCH period, pp2 corresponds to 2 PDCCH periods and so on. |
| ***drx-RetransmissionTimer***  Timer for DRX in TS 36.321 [6]. Value in number of PDCCH periods. Value pp0 corresponds to 0 PDCCH period and behaviour as specified in 7.3.2 applies, pp1 corresponds to 1 PDCCH period, pp2 corresponds to 2 PDCCH periods and so on. |
| ***drx-ULRetransmissionTimer***  Timer for DRX in TS 36.321 [6].  Value in number of PDCCH periods. Value pp0 corresponds to 0 PDCCH period and behaviour as specified in 7.3.2 applies, value pp1 corresponds to 1 PDCCH period, pp2 corresponds to 2 PDCCH periods and so on. |
| ***logicalChannelSR-ProhibitTimer***  Timerused to delay the transmission of an SR*.* See TS 36.321 [6]. Value in number of PDCCH periods. Value pp2 corresponds to 2 PDCCH periods, pp8 corresponds to 8 PDCCH periods and so on. |
| ***offsetThresholdTA***  Offset for TA reporting as specified in TS 36.321 [6]. Value *ms0dot5* corresponds to 0.5 millisecond, value *ms1* corresponds to 1 millisecond and so on. |
| ***periodicBSR-Timer***  Timer for BSR reporting in TS 36.321 [6].  Value in number of PDCCH periods. Value pp2 corresponds to 2 PDCCH periods, pp4 corresponds to 4 PDCCH periods and so on. |
| ***ra-CFRA-Config***  Activation of contention free random access (CFRA), see TS 36.321 [6]. |
| ***rai-Activation***  Activation of release assistance indication (RAI) in TS 36.321 [6]. |
| ***retxBSR-Timer***  Timer for BSR reporting in TS 36.321 [6]. Value in number of PDCCH periods. Value pp4 corresponds to 4 PDCCH periods, pp16 corresponds to 16 PDCCH periods and so on. |
| ***onDurationTimer***  Timer for DRX in TS 36.321 [6]. Value in number of PDCCH periods. Value pp1 corresponds to 1 PDCCH period, pp2 corresponds to 2 PDCCH periods and so on. |
| ***timeAlignmentTimer***  Indicates the value of the time alignment timer, see TS 36.321 [6]. |

#### – *NPDCCH-ConfigDedicated-NB*

The IE *NPDCCH-ConfigDedicated-NB* specifies the subframes and resource blocks for NPDCCH monitoring.

*NPDCCH-ConfigDedicated-NB* information element

-- ASN1START

NPDCCH-ConfigDedicated-NB-r13 ::= SEQUENCE {

npdcch-NumRepetitions-r13 ENUMERATED {r1, r2, r4, r8, r16, r32, r64, r128,

r256, r512, r1024, r2048,

spare4, spare3, spare2, spare1},

npdcch-StartSF-USS-r13 ENUMERATED {v1dot5, v2, v4, v8, v16, v32, v48, v64},

npdcch-Offset-USS-r13 ENUMERATED {zero, oneEighth, oneFourth, threeEighth}

}

NPDCCH-ConfigDedicated-NB-v1530 ::= SEQUENCE {

npdcch-StartSF-USS-v1530 ENUMERATED {v96, v128}

}

-- ASN1STOP

| *NPDCCH-ConfigDedicated-NB* field descriptions |
| --- |
| ***npdcch-NumRepetitions***  Maximum number of repetitions for NPDCCH UE specific search space (USS), see TS 36.213 [23], clause 16.6. UE monitors one set of values (consisting of aggregation level, number of repetitions and number of blind decodes) according to the configured maximum number of repetitions. |
| ***npdcch-Offset-USS***  Fractional period offset of starting subframe for NPDCCH UE specific search space (USS), see TS 36.213 [23], clause 16.6. |
| ***npdcch-StartSF-USS***  Starting subframe configuration for an NPDCCH UE-specific search space, see TS 36.213 [23], clause 16.6. Value v1dot5 corresponds to 1.5, value 2 corresponds to 2 and so on. E-UTRAN may configure values *v1dot5* and *v2* only in FDD mode and values *v96* and *v128* only in TDD mode.  The UE shall use the value signalled in *npdcch-StartSF-USS-v1530,* if present, and ignore the value signalled in *npdcch-StartSF-USS-r13*. |

#### – *NPDSCH-Config-NB*

The IE *NPDSCH-ConfigCommon-NB* is used to specify the common NPDSCH configuration. The IE *NPDSCH-ConfigDedicated-NB* is used to specify the UE specific NPDSCH configuration.

*NPDSCH-Config-NB* information element

-- ASN1START

NPDSCH-ConfigCommon-NB-r13 ::= SEQUENCE {

nrs-Power-r13 INTEGER (-60..50)

}

NPDSCH-ConfigDedicated-NB-r16 ::= SEQUENCE {

npdsch-MultiTB-Config-r16 NPDSCH-MultiTB-Config-NB-r16 OPTIONAL -- Cond twoHARQ

}

NPDSCH-MultiTB-Config-NB-r16 ::= SEQUENCE {

multiTB-Config-r16 ENUMERATED {interleaved, nonInterleaved},

harq-AckBundling-r16 ENUMERATED {true} OPTIONAL -- Cond interleaved

}

NPDSCH-16QAM-Config-NB-r17 ::=SEQUENCE{

nrs-PowerRatio-r17 ENUMERATED {dB-6, dB-4dot77, dB-3, dB-1dot77, dB0, dB1, dB2, dB3} OPTIONAL,

nrs-PowerRatioWithCRS-r17 ENUMERATED {dB-6, dB-4dot77, dB-3, dB-1dot77, dB0, dB1, dB2, dB3} OPTIONAL -- Cond InBand

}

-- ASN1STOP

| *NPDSCH-Config-NB* field descriptions |
| --- |
| ***multiTB-Config***  For FDD: Activation of multiple TBs scheduling in DL, see TS 36.213 [23]. Value *interleaved* indicates that multiple TBs scheduling with interleaved transmission is enabled, value *nonInterleaved* indicates that multiple TBs scheduling without interleaved transmission is enabled. |
| ***harq-AckBundling***  For FDD: Activation of HARQ ACK bundling for DL multiple TBs scheduling with interleaved transmission, see TS 36.213 [23]. |
| ***npdsch-16QAM-Config***  Activativation of 16QAM for DL, see TS 36.213 [23]. |
| ***nrs-Power***  Provides the downlink narrowband reference-signal EPRE, see TS 36.213 [23], clause 16.2. The actual value in dBm. |
| ***nrs-PowerRatio***  The power ratio of NPDSCH EPRE to NRS EPRE in symbols without NRS for standalone and guardband deployments, or in symbols without NRS nor CRS for in-band deployments. If this field is absent then legacy power ratio of NPDSCH EPRE to NRS EPRE applies. See TS 36.213 [23]. |
| ***nrs-PowerRatioWithCRS***  The power ratio of NPDSCH EPRE to NRS EPRE in symbols with CRS for inband deployments, see TS 36.213 [23]. |

| Conditional presence | Explanation |
| --- | --- |
| *InBand* | The field is mandatory present if carrier is inband; otherwise, the field is not present and the UE shall delete any existing value for this field. |
| *interleaved* | The field is optionally present, Need OR, if *multiTB-Config* is set to *interleaved*; otherwise the field is not present and the UE shall delete any existing value for this field. |
| *twoHARQ* | The field is optionally present, Need OR, if *twoHARQ-ProcessesConfig* is configured; otherwise the field is not present and the UE shall delete any existing value for this field. |

#### – *NPRACH-ConfigSIB-NB*

The IE *NPRACH-ConfigSIB-NB* is used to specify the NPRACH configuration for the anchor and non-anchor carriers.

*NPRACH-ConfigSIB-NB* information elements

-- ASN1START

NPRACH-ConfigSIB-NB-r13 ::= SEQUENCE {

nprach-CP-Length-r13 ENUMERATED {us66dot7, us266dot7},

rsrp-ThresholdsPrachInfoList-r13 RSRP-ThresholdsNPRACH-InfoList-NB-r13 OPTIONAL, -- Need OR

nprach-ParametersList-r13 NPRACH-ParametersList-NB-r13

}

NPRACH-ConfigSIB-NB-v1330 ::= SEQUENCE {

nprach-ParametersList-v1330 NPRACH-ParametersList-NB-v1330

}

NPRACH-ConfigSIB-NB-v1450 ::= SEQUENCE {

maxNumPreambleAttemptCE-r14 ENUMERATED {n3, n4, n5, n6, n7, n8, n10, spare1}

}

NPRACH-ConfigSIB-NB-v1530 ::= SEQUENCE {

tdd-Parameters-r15 SEQUENCE {

nprach-PreambleFormat-r15 ENUMERATED {

fmt0, fmt1, fmt2, fmt0-a, fmt1-a},

dummy ENUMERATED {

n1, n2, n4, n8, n16, n32, n64, n128,

n256, n512, n1024},

nprach-ParametersListTDD-r15 NPRACH-ParametersListTDD-NB-r15

} OPTIONAL, -- Cond TDD

fmt2-Parameters-r15 SEQUENCE {

nprach-ParametersListFmt2-r15 NPRACH-ParametersListFmt2-NB-r15 OPTIONAL, -- Need OR

nprach-ParametersListFmt2EDT-r15 NPRACH-ParametersListFmt2-NB-r15 OPTIONAL -- Cond EDT2

} OPTIONAL, -- Need OR

edt-Parameters-r15 SEQUENCE {

edt-SmallTBS-Subset-r15 ENUMERATED {true} OPTIONAL, -- Need OR

edt-TBS-InfoList-r15 EDT-TBS-InfoList-NB-r15,

nprach-ParametersListEDT-r15 NPRACH-ParametersList-NB-r14 OPTIONAL -- Need OR

} OPTIONAL -- Cond EDT1

}

NPRACH-ConfigSIB-NB-v1550 ::= SEQUENCE {

tdd-Parameters-v1550 SEQUENCE {

nprach-ParametersListTDD-v1550 NPRACH-ParametersListTDD-NB-v1550

}

}

NPRACH-ParametersList-NB-r13 ::= SEQUENCE (SIZE (1.. maxNPRACH-Resources-NB-r13)) OF NPRACH-Parameters-NB-r13

NPRACH-ParametersList-NB-v1330 ::= SEQUENCE (SIZE (1.. maxNPRACH-Resources-NB-r13)) OF NPRACH-Parameters-NB-v1330

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

nprach-Periodicity-r13 ENUMERATED {ms40, ms80, ms160, ms240,

ms320, ms640, ms1280, ms2560},

nprach-StartTime-r13 ENUMERATED {ms8, ms16, ms32, ms64,

ms128, ms256, ms512, ms1024},

nprach-SubcarrierOffset-r13 ENUMERATED {n0, n12, n24, n36, n2, n18, n34, spare1},

nprach-NumSubcarriers-r13 ENUMERATED {n12, n24, n36, n48},

nprach-SubcarrierMSG3-RangeStart-r13 ENUMERATED {zero, oneThird, twoThird, one},

maxNumPreambleAttemptCE-r13 ENUMERATED {n3, n4, n5, n6, n7, n8, n10, spare1},

numRepetitionsPerPreambleAttempt-r13 ENUMERATED {n1, n2, n4, n8, n16, n32, n64, n128},

npdcch-NumRepetitions-RA-r13 ENUMERATED {r1, r2, r4, r8, r16, r32, r64, r128,

r256, r512, r1024, r2048,

spare4, spare3, spare2, spare1},

npdcch-StartSF-CSS-RA-r13 ENUMERATED {v1dot5, v2, v4, v8, v16, v32, v48, v64},

npdcch-Offset-RA-r13 ENUMERATED {zero, oneEighth, oneFourth, threeEighth}

}

NPRACH-Parameters-NB-v1330 ::= SEQUENCE {

nprach-NumCBRA-StartSubcarriers-r13 ENUMERATED {n8, n10, n11, n12, n20, n22, n23, n24,

n32, n34, n35, n36, n40, n44, n46, n48}

}

NPRACH-ParametersList-NB-r14 ::= SEQUENCE (SIZE (1.. maxNPRACH-Resources-NB-r13)) OF

NPRACH-Parameters-NB-r14

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

nprach-Parameters-r14 SEQUENCE {

nprach-Periodicity-r14 ENUMERATED {ms40, ms80, ms160, ms240,

ms320, ms640, ms1280, ms2560}

OPTIONAL, -- NEED OP

nprach-StartTime-r14 ENUMERATED {ms8, ms16, ms32, ms64,

ms128, ms256, ms512, ms1024}

OPTIONAL, -- NEED OP

nprach-SubcarrierOffset-r14 ENUMERATED {n0, n12, n24, n36, n2, n18, n34, spare1}

OPTIONAL, -- NEED OP

nprach-NumSubcarriers-r14 ENUMERATED {n12, n24, n36, n48}

OPTIONAL, -- NEED OP

nprach-SubcarrierMSG3-RangeStart-r14 ENUMERATED {zero, oneThird, twoThird, one}

OPTIONAL, -- NEED OP

npdcch-NumRepetitions-RA-r14 ENUMERATED {r1, r2, r4, r8, r16, r32, r64, r128,

r256, r512, r1024, r2048,

spare4, spare3, spare2, spare1}

OPTIONAL, -- NEED OP

npdcch-StartSF-CSS-RA-r14 ENUMERATED {v1dot5, v2, v4, v8, v16, v32, v48, v64}

OPTIONAL, -- NEED OP

npdcch-Offset-RA-r14 ENUMERATED {zero, oneEighth, oneFourth, threeEighth}

OPTIONAL, -- NEED OP

nprach-NumCBRA-StartSubcarriers-r14 ENUMERATED {n8, n10, n11, n12, n20, n22, n23, n24,

n32, n34, n35, n36, n40, n44, n46, n48}

OPTIONAL, -- NEED OP

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

OPTIONAL, -- Need OP

...

} OPTIONAL -- Need OR

}

NPRACH-ParametersListTDD-NB-r15 ::= SEQUENCE (SIZE (1.. maxNPRACH-Resources-NB-r13)) OF

NPRACH-ParametersTDD-NB-r15

NPRACH-ParametersTDD-NB-r15 ::= SEQUENCE {

nprach-Parameters-r15 SEQUENCE {

nprach-Periodicity-r15 ENUMERATED {ms80, ms160, ms320, ms640,

ms1280, ms2560, ms5120, ms10240}

OPTIONAL, -- NEED OP

nprach-StartTime-r15 ENUMERATED {ms10, ms20, ms40, ms80,

ms160, ms320, ms640, ms1280,

ms2560, ms5120, spare6, spare5,

spare4, spare3, spare2, spare1}

OPTIONAL, -- NEED OP

nprach-SubcarrierOffset-r15 ENUMERATED {n0, n12, n24, n36, n2, n18, n34, spare1}

OPTIONAL, -- NEED OP

nprach-NumSubcarriers-r15 ENUMERATED {n12, n24, n36, n48}

OPTIONAL, -- NEED OP

nprach-SubcarrierMSG3-RangeStart-r15 ENUMERATED {zero, oneThird, twoThird, one}

OPTIONAL, -- NEED OP

npdcch-NumRepetitions-RA-r15 ENUMERATED {r1, r2, r4, r8, r16, r32, r64, r128,

r256, r512, r1024, r2048,

spare4, spare3, spare2, spare1}

OPTIONAL, -- NEED OP

npdcch-StartSF-CSS-RA-r15 ENUMERATED {v4, v8, v16, v32, v48, v64, v96, v128}

OPTIONAL, -- NEED OP

npdcch-Offset-RA-r15 ENUMERATED {zero, oneEighth, oneFourth, threeEighth}

OPTIONAL, -- NEED OP

nprach-NumCBRA-StartSubcarriers-r15 ENUMERATED {n8, n10, n11, n12, n20, n22, n23, n24,

n32, n34, n35, n36, n40, n44, n46, n48}

OPTIONAL, -- NEED OP

...

} OPTIONAL -- Need OR

}

NPRACH-ParametersListTDD-NB-v1550 ::= SEQUENCE (SIZE (1.. maxNPRACH-Resources-NB-r13)) OF

NPRACH-ParametersTDD-NB-v1550

NPRACH-ParametersTDD-NB-v1550 ::= SEQUENCE {

maxNumPreambleAttemptCE-v1550 ENUMERATED {n3, n4, n5, n6, n7, n8, n10, spare1},

numRepetitionsPerPreambleAttempt-v1550 ENUMERATED {n1, n2, n4, n8, n16, n32, n64, n128,

n256, n512, n1024}

}

NPRACH-ParametersListFmt2-NB-r15 ::= SEQUENCE (SIZE (1.. maxNPRACH-Resources-NB-r13)) OF NPRACH-ParametersFmt2-NB-r15

NPRACH-ParametersFmt2-NB-r15 ::= SEQUENCE {

nprach-Parameters-r15 SEQUENCE {

nprach-Periodicity-r15 ENUMERATED {ms40, ms80, ms160, ms320,

ms640, ms1280, ms2560, ms5120}

OPTIONAL, -- NEED OP

nprach-StartTime-r15 ENUMERATED {ms8, ms16, ms32, ms64,

ms128, ms256, ms512, ms1024}

OPTIONAL, -- NEED OP

nprach-SubcarrierOffset-r15 ENUMERATED {n0, n36, n72, n108, n6, n54, n102, n42,

n78, n90, n12, n24, n48, n84, n60, n18}

OPTIONAL, -- NEED OP

nprach-NumSubcarriers-r15 ENUMERATED {n36, n72, n108, n144}

OPTIONAL, -- NEED OP

nprach-SubcarrierMSG3-RangeStart-r15 ENUMERATED {zero, oneThird, twoThird, one}

OPTIONAL, -- NEED OP

npdcch-NumRepetitions-RA-r15 ENUMERATED {r1, r2, r4, r8, r16, r32, r64, r128,

r256, r512, r1024, r2048,

spare4, spare3, spare2, spare1}

OPTIONAL, -- NEED OP

npdcch-StartSF-CSS-RA-r15 ENUMERATED {v1dot5, v2, v4, v8, v16, v32, v48, v64}

OPTIONAL, -- NEED OP

npdcch-Offset-RA-r15 ENUMERATED {zero, oneEighth, oneFourth, threeEighth}

OPTIONAL, -- NEED OP

nprach-NumCBRA-StartSubcarriers-r15 ENUMERATED {

n24, n30, n33, n36, n60, n66, n69, n72,

n96, n102, n105, n108, n120, n132, n138, n144}

OPTIONAL, -- NEED OP

npdcch-CarrierIndex-r15 INTEGER (1..maxNonAnchorCarriers-NB-r14)

OPTIONAL, -- Need OP

...

} OPTIONAL -- Need OR

}

NPRACH-TxDurationFmt01-NB-r17 ::= SEQUENCE {

nprach-TxDurationFmt01-r17 ENUMERATED {v2dot4, v4dot4, v8dot4, v16dot4, v32dot4, v64dot4}

}

NPRACH-TxDurationFmt2-NB-r17 ::= SEQUENCE {

nprach-TxDurationFmt2-r17 ENUMERATED {v1dot6, v2dot6, v4dot6, v8dot6, v16dot6}

}

RSRP-ThresholdsNPRACH-InfoList-NB-r13 ::= SEQUENCE (SIZE(1..2)) OF RSRP-Range

EDT-TBS-InfoList-NB-r15 ::= SEQUENCE (SIZE (1.. maxNPRACH-Resources-NB-r13)) OF EDT-TBS-NB-r15

EDT-TBS-NB-r15 ::= SEQUENCE {

edt-SmallTBS-Enabled-r15 BOOLEAN,

edt-TBS-r15 ENUMERATED {b328, b408, b504, b584, b680, b808, b936, b1000}

}

-- ASN1STOP

| *NPRACH-ConfigSIB-NB* field descriptions |
| --- |
| ***dummy***  This field is not used in the specification. If received it shall be ignored by the UE. |
| ***edt-SmallTBS-Enabled***  Value TRUE indicates UE performing EDT is allowed to select TBS smaller than *edt-TBS* for Msg3 according to the corresponding NPRACH resource, as specified in TS 36.213 [23]. |
| ***edt-SmallTBS-Subset***  Presence indicates only two of the TBS values can be used according to *edt-TBS* corresponding to the NPRACH resource, as specified in TS 36.213 [23]. When the field is not present, any of the TBS values according to *edt-TBS* corresponding to the NPRACH resource can be used. This field is applicable for a NPRACH resource only when *edt-SmallTBS-Enabled* is included for the corresponding NPRACH resource. |
| ***edt-TBS***  Largest TBS for Msg3 for a NPRACH resource applicable to a UE performing EDT. Value in bits. Value b328 corresponds to 328 bits, value b408 corresponds to 408 bits and so on. See TS 36.213 [23]. |
| ***maxNumPreambleAttemptCE***  Maximum number of preamble transmission attempts per NPRACH resource. See TS 36.321 [6].  If the UE supports enhanced random access power control and *maxNumPreambleAttemptCE-r14* is included, the UE shall use *maxNumPreambleAttemptCE-r14* instead of *maxNumPreambleAttemptCE-r13* for the first entry in *nprach-ParametersList*.  *maxNumPreambleAttemptCE-r13* applies to FDD and *maxNumPreambleAttemptCE-v1550* applies to TDD. |
| ***npdcch-CarrierIndex***  For FDD: Index of the carrier in the list of DL non anchor carriers. The first entry in the list has index '1', the second entry has index '2' and so on.  If the UE supports mixed operation mode and *dl-ConfigListMixed* is present in *systemInformationBlockType22-NB*, the UE creates a combined list of DL carriers for random access by appending *dl-ConfigListMixed* to the *dl-ConfigList* while maintaining the order among both *dl-ConfigList* and *dl-ConfigListMixed*; only the first *maxNonAnchorCarriers-NB-r14* DL non-anchor carriers in the concatenated list can be used for random access.  If the field is absent in the entry in *nprach-ParametersListEDT* in *SystemInformationBlockType22-NB*, the value of *npdcch-CarrierIndex* in the corresponding entry of *nprach-ParametersList* applies, if present. If the field is absent in an entry in *nprach-ParametersListFmt2EDT* in *SystemInformationBlockType23-NB*, the value of *npdcch-CarrierIndex* in the corresponding entry of *nprach-ParametersListFmt2* applies, if present. Otherwise, the DL anchor carrier is used.  For TDD: This parameter is absent and the same carrier is used in uplink and downlink. |
| ***npdcch-NumRepetitions-RA***  Maximum number of repetitions for NPDCCH common search space (CSS) for RAR, Msg3 retransmission and Msg4, see TS 36.213 [23], clause 16.6.  See NOTE. |
| ***npdcch-Offset-RA***  Fractional period offset of starting subframe for NPDCCH common search space (CSS Type 2), see TS 36.213 [23], clause 16.6.  See NOTE. |
| ***npdcch-StartSF-CSS-RA***  Starting subframe configuration for NPDCCH common search space (CSS), including RAR, Msg3 retransmission, and Msg4, see TS 36.213 [23], clause 16.6.  See NOTE. |
| ***nprach-CP-Length***  Cyclic prefix length for NPRACH transmission (TCP), see TS 36.211 [21], clause 10.1.6. Value us66dot7 corresponds to 66.7 microseconds and value us266dot7 corresponds to 266.7 microseconds. If the UE uses a NPRACH resource for preamble format 2*,* the UE ignores the value signalled in *nprach-CP-Length* and considers the value to be800 microseconds. |
| ***nprach-NumCBRA-StartSubcarriers***  The number of start subcarriers from which a UE can randomly select a start subcarrier as specified in TS 36.321 [6].  If *nprach-Config-v1330* is not included in *SystemInformationBlockType2-NB*, the UE sets the value of *nprach-NumCBRA-StartSubcarriers-r13* to the value signalled by *nprach-NumSubcarriers-r13* for the corresponding NPRACH resource.  The start subcarrier indices that the UE is allowed to randomly select from, are given by:  *nprach-SubcarrierOffset* + [0, *nprach-NumCBRA-StartSubcarriers* - 1].  See NOTE. |
| ***nprach-NumSubcarriers***  Number of sub-carriers in a NPRACH resource, see TS 36.211 [21], clause 10.1.6. In number of subcarriers.  See NOTE. |
| ***nprach-ParametersList, nprach-ParametersListEDT***  Configures NPRACH parameters for each NPRACH resource. Up to three PRACH resources can be configured in *nprach-ParametersList* in a cell. Each NPRACH resource is associated with a different number of NPRACH repetitions.  E-UTRAN includes the same number of entries, and listed in the same order for *nprach-ParametersListEDT*, as in *nprach-ParametersList* in *SystemInformationBlockType2-NB*.  The NPRACH resources in *nprach-ParametersListEDT* are used to initiateEDT. Each NPRACH resource is associated with a TBS signalled in the corresponding entry of *edt-TBS-InfoList.*  For TDD: The UE shall use *nprach-ParametersListTDD* and ignore *nprach-ParametersList.* |
| ***nprach-ParametersListTDD***  For TDD: Configure NPRACH parameters for each NPRACH. Up to three NPRACH resources can be configured in a cell. Each NPRACH resource is associated with a different number of NPRACH repetitions. |
| ***nprach-ParametersListFmt2, nprach-ParametersListFmt2EDT***  Configures NPRACH parameters for each NPRACH resource format 2. Up to three NPRACH resources can be configured on one carrier. Each NPRACH resource is associated with a different number of NPRACH repetitions. E-UTRAN includes the same number of entries, and listed in the same order, as in *nprach-ParametersList* in *SystemInformationBlockType2-NB*.  The NPRACH resources in *nprach-ParametersListFmt2EDT* are used to initiate EDT. Each NPRACH resource is associated with a TBS signalled in the corresponding entry of *edt-TBS-InfoList.*  E-UTRAN configures the NPRACH resources format 2 so that they do not overlap in time domain with the NPRACH resources configured in *nprach-ParametersList* and *nprach-ParametersListEDT*.  If there is no NPRACH resource in *nprach-ParametersListFmt2* (respectively *nprach-ParametersListFmt2EDT*) on any UL carrier for one NPRACH repetition level, the UE uses the NPRACH resources in *nprach-ParametersList* (respectively *nprach-ParametersListEDT*) for this NPRACH repetition level. Otherwise, the UE uses only NPRACH resources in *nprach-ParametersListFmt2* (respectively *nprach-ParametersListFmt2EDT*). |
| ***nprach-Periodicity***  Periodicity of a NPRACH resource, see TS 36.211 [21], clause10.1.6. Unit in millisecond.  See NOTE. |
| ***nprach-PreambleFormat***  TDD: TDD preamble format, see TS 36.211 [21]. clause 10.1.6,  Value *fmt0* corresponds to preamble format 0, value *fmt1* corresponds to preamble format 1 and so on. |
| ***nprach-StartTime***  Start time of the NPRACH resource in one period, see TS 36.211 [21], clause 10.1.6. Unit in millisecond.  See NOTE. |
| ***nprach-SubcarrierOffset***  Frequency location of the NPRACH resource, see TS 36.211 [21], clause 10.1.6. In number of subcarriers, offset from sub-carrier 0.  See NOTE. |
| ***nprach-SubcarrierMSG3-RangeStart***  Fraction for calculating the starting subcarrier index of the range reserved for indication of UE support for multi-tone Msg3 transmission, within the NPRACH resource, see TS 36.211 [21], clause 10.1.6. Multi-tone Msg3 transmission is not supported for {32, 64, 128} repetitions of NPRACH. For at least one of the NPRACH resources with the number of NPRACH repetitions other than {32, 64, 128}, the value of *nprach-SubcarrierMSG3-RangeStart* should not be 0.  If *nprach-SubcarrierMSG3-RangeStart* is equal to zero, no start subcarrier index for the single-tone Msg3 NPRACH is allocated and the start subcarrier indexes for the multi-tone Msg3 NPRACH partition are given by *nprach-SubcarrierOffset* + [0, *nprach-NumCBRA-StartSubcarriers* - 1].  If *nprach-SubcarrierMSG3-RangeStart* is equal to oneThirdor twoThird, the start subcarrier indexes for the two partitions are given by:  *nprach-SubcarrierOffset* + [0, FLOOR (*nprach-NumCBRA-StartSubcarriers \** *nprach-SubcarrierMSG3-RangeStart*) -1]  for the single-tone Msg3 NPRACH partition;  *nprach-SubcarrierOffset* + [FLOOR (*nprach-NumCBRA-StartSubcarriers \* nprach-SubcarrierMSG3-RangeStart*)*, nprach-NumCBRA-StartSubcarriers* - 1]  for the multi-tone Msg3 NPRACH partition;  If *nprach-SubcarrierMSG3-RangeStart* is equal to one, the start subcarrier indexes for the single-tone Msg3 NPRACH are given by *nprach-SubcarrierOffset* + [0, *nprach-NumCBRA-StartSubcarriers* - 1] and no start subcarrier index for the multi-tone Msg3 NPRACH partition is allocated.  See NOTE. |
| ***nprach-TxDurationFmt01***  Duration of PRACH segment transmission for PRACH resource format 0 and format 1 in NTN transmission, see TS 36.213 [23]. Unit in duration of one preamble transmission (TCP+TSEQ).  Value *v2dot4* corresponds to the duration of 2.4 preamble transmission, value *v4dot4* corresponds to the duration of 4.4 preambles transmission and so on. |
| ***nprach-TxDurationFmt2***  Duration of PRACH segment transmission for PRACH resource format 2 in NTN transmission, see TS 36.213 [23]. Unit in duration of one preamble transmission (TCP+TSEQ).  Value *v1dot6* corresponds to the duration of 1.6 preamble transmission, value *v2dot*6 corresponds to the duration of 2.6 preambles transmission and so on. |
| ***numRepetitionsPerPreambleAttempt***  Number of NPRACH repetitions per attempt for each NPRACH resource, See TS 36.211 [21], clause 10.1.6. *numRepetitionsPerPreambleAttempt-r13* applies to FDD and *numRepetitionsPerPreambleAttempt-v1550* applies to TDD. |
| ***rsrp-ThresholdsPrachInfoList***  The criterion for UEs to select a NPRACH resource. Up to 2 RSRP threshold values can be signalled. The first element corresponds to RSRP threshold 1, the second element corresponds to RSRP threshold 2. See TS 36.321 [6]. If absent, there is only one NPRACH resource.  A UE that supports *powerClassNB-14dBm-r14* shall correct the RSRP threshold values before applying them as follows:  RSRP threshold = Signalled RSRP threshold - min{0, (14-min(23, P-Max))} where P-Max*:*is the value of *p-Max* field in *SystemInformationBlockType1-NB.* |

NOTE:

- If the field is absent in an entry of *nprach-ParametersList* in *SystemInformationBlockType22-NB*, the value of the same field in the corresponding entry of *nprach-ParametersList* in *SystemInformationBlockType2-NB* applies.

- If the field is absent in the entry in *nprach-ParametersListEDT*, the value of the same field in the corresponding entry of *nprach-ParametersList* on the same UL carrierapplies, if present. Otherwise, the value of the same field in the corresponding entry of *nprach-ParametersList* in *SystemInformationBlockType2-NB* applies.

- If the field is absent in an entry of *nprach-ParametersListTDD* in *SystemInformationBlockType22-NB*, the value of the same field in the corresponding entry of *nprach-ParametersListTDD* in *SystemInformationBlockType2-NB* applies. The field is mandatory present in *nprach-ParametersListTDD* in *SystemInformationBlockType2-NB.*

- If the field is absent in an entry of *nprach-ParametersListFmt2* in *SystemInformationBlockType23-NB*, the value of the same field, if present, in the corresponding entry of *nprach-ParametersListFmt2* in *SystemInformationBlockType2-NB* applies. Otherwise the value of the same field, if present,in thecorresponding entry of the first occurence of *nprach-ParametersListFmt2* in the non anchor carrier list applies. Otherwise, the value of the same field in the corresponding entry of *nprach-ParametersList* in *SystemInformationBlockType2-NB* applies.

- If the field is absent in an entry of *nprach-ParametersListFmt2* in *SystemInformationBlockType2-NB*, the value of the same field in the corresponding entry of *nprach-ParametersList* in *SystemInformationBlockType2-NB* applies.

- If the field is absent in an entry of *nprach-ParametersListFmt2EDT* in *SystemInformationBlockType23-NB*, the value of the same field, if present, in the corresponding entry of *nprach-ParametersListFmt2* on the same UL carrierapplies. Otherwise, the value of the same field, if present, in the corresponding entry of *nprach-ParametersListFmt2* in *SystemInformationBlockType2-NB* applies. Otherwise the value of the same field, if present,in thecorresponding entry of the first occurence of *nprach-ParametersListFmt2* in the non anchor carrier list applies. Otherwise, the value of the same field in the corresponding entry of *nprach-ParametersList* in *SystemInformationBlockType2-NB* applies.

- If the field is absent in an entry of *nprach-ParametersListFmt2EDT* in *SystemInformationBlockType2-NB*, the value of the same field, if present, in the corresponding entry of *nprach-ParametersListFmt2* in *SystemInformationBlockType2-NB* applies. Otherwise the value of the same field in the corresponding entry of *nprach-ParametersList* in *SystemInformationBlockType2-NB* applies.

| Conditional presence | Explanation |
| --- | --- |
| *EDT1* | The field is mandatory present if *cp-EDT*, *cp-EDT-5GC*, *up-EDT* or *up-EDT-5GC* in *SystemInformationBlockType2-NB* is present; otherwise the field is not present and the UE shall delete any existing value for this field. |
| *EDT2* | 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. |
| *TDD* | This field is mandatory present for TDD; otherwise the field is not present and the UE shall delete any existing value for this field. |

#### – *NPUSCH-Config-NB*

The IE *NPUSCH-ConfigCommon-NB* is used to specify the common NPUSCH configuration. The IE *NPUSCH-ConfigDedicated-NB* is used to specify the UE specific NPUSCH configuration.

*NPUSCH-Config-NB* information element

-- ASN1START

NPUSCH-ConfigCommon-NB-r13 ::= SEQUENCE {

ack-NACK-NumRepetitions-Msg4-r13 SEQUENCE (SIZE(1.. maxNPRACH-Resources-NB-r13)) OF

ACK-NACK-NumRepetitions-NB-r13,

srs-SubframeConfig-r13 ENUMERATED {

sc0, sc1, sc2, sc3, sc4, sc5, sc6, sc7,

sc8, sc9, sc10, sc11, sc12, sc13, sc14, sc15

} OPTIONAL, -- Need OR

dmrs-Config-r13 SEQUENCE {

threeTone-BaseSequence-r13 INTEGER (0..12) OPTIONAL, -- Need OP

threeTone-CyclicShift-r13 INTEGER (0..2),

sixTone-BaseSequence-r13 INTEGER (0..14) OPTIONAL, -- Need OP

sixTone-CyclicShift-r13 INTEGER (0..3),

twelveTone-BaseSequence-r13 INTEGER (0..30) OPTIONAL -- Need OP

} OPTIONAL, -- Need OR

ul-ReferenceSignalsNPUSCH-r13 UL-ReferenceSignalsNPUSCH-NB-r13

}

UL-ReferenceSignalsNPUSCH-NB-r13 ::= SEQUENCE {

groupHoppingEnabled-r13 BOOLEAN,

groupAssignmentNPUSCH-r13 INTEGER (0..29)

}

NPUSCH-ConfigDedicated-NB-r13 ::= SEQUENCE {

ack-NACK-NumRepetitions-r13 ACK-NACK-NumRepetitions-NB-r13 OPTIONAL, -- Need ON

npusch-AllSymbols-r13 BOOLEAN OPTIONAL, -- Cond SRS

groupHoppingDisabled-r13 ENUMERATED {true} OPTIONAL -- Need OR

}

NPUSCH-ConfigDedicated-NB-v1610 ::= SEQUENCE {

npusch-MultiTB-Config-r16 ENUMERATED {interleaved, nonInterleaved}

}

NPUSCH-ConfigDedicated-NB-v1700 ::= SEQUENCE {

npusch-16QAM-Config-r17 ENUMERATED {true} OPTIONAL -- Need OR

}

NPUSCH-TxDuration-NB-r17 ::= SEQUENCE {

npusch-TxDuration-r17 ENUMERATED {ms2, ms4, ms8, ms16, ms32, ms64, ms128, ms256}

}

ACK-NACK-NumRepetitions-NB-r13 ::= ENUMERATED {r1, r2, r4, r8, r16, r32, r64, r128}

-- ASN1STOP

| *NPUSCH-Config-NB* field descriptions |
| --- |
| ***ack-NACK-NumRepetitions***  Number of repetitions for the ACK NACK resource unit carrying HARQ response to NPDSCH, see TS 36.213 [23], clause 16.4.2. If this field is absentand no value was configured via dedicated signalling, the value used for reception of Msg4 is used. |
| ***ack-NACK-NumRepetitions-Msg4***  Number of repetitions for ACK/NACK HARQ response to NPDSCH containing Msg4 per NPRACH resource, see TS 36.213 [23], clause 16.4.2. |
| ***groupAssignmentNPUSCH***  See TS 36.211 [21], clause 10.1.4.1.3. |
| ***groupHoppingDisabled***  See TS 36.211 [21], clause 10.1.4.1.3. |
| ***groupHoppingEnabled***  See TS 36.211 [21], clause 10.1.4.1.3. |
| ***npusch-16QAM-Config***  Activation of 16QAM for UL, see TS 36.213 [23]. |
| ***npusch-AllSymbols***  If set to TRUE, the UE shall use all NB-IoT symbols for NPUSCH transmission. If set to FALSE, the UE punctures the NPUSCH transmissions in the symbols that collides with SRS. If the field is not present, the UE uses all NB-IoT symbols for NPUSCH transmission. See TS 36.211 [21], clause 10.1.3.6. |
| ***npusch-MultiTB-Config***  For FDD: Activation of multiple TBs scheduling in UL, see TS 36.213 [23]. Value *interleaved* indicates that multiple TBs scheduling with interleaved transmission is enabled, value *nonInterleaved* indicates that multiple TBs scheduling without interleaved transmission is enabled. |
| ***npusch-TxDuration***  Duration of NPUSCH segment transmission in NTN transmission, see TS 36.213 [23]. Unit in ms.  Value *ms2* corresponds to 2 ms, value *ms4* corresponds to 4 ms and so on. |
| ***sixTone-BaseSequence***  The base sequence of DMRS sequence in a cell for 6 tones transmission; see TS 36.211 [21], clause 10.1.4.1.2. If absent, it is given by NB-IoT CellID mod 14. Value 14 is not used. |
| ***sixTone-CyclicShift***  Define 4 cyclic shifts for the 6-tone case, see TS 36.211 [21], clause 10.1.4.1.2. |
| ***srs-SubframeConfig***  SRS SubframeConfiguration. See TS 36.211 [21], table 5.5.3.3-1. Value sc0 corresponds to value 0, sc1 to value 1 and so on. |
| ***threeTone-BaseSequence***  The base sequence of DMRS sequence in a cell for 3 tones transmission; see TS 36.211 [21], clause 10.1.4.1.2. If absent, it is given by NB-IoT CellID mod 12. Value 12 is not used. |
| ***threeTone-CyclicShift***  Define 3 cyclic shifts for the 3-tone case, see TS 36.211 [21], clause 10.1.4.1.2. |
| ***twelveTone-BaseSequence***  The base sequence of DMRS sequence in a cell for 12 tones transmission; see TS 36.211 [21], clause 10.1.4.1.2. If absent, it is given by NB-IoT CellID mod 30. Value 30 is not used. |
| ***ul-ReferenceSignalsNPUSCH***  Used to specify parameters needed for the transmission on NPUSCH. |

| Conditional presence | Explanation |
| --- | --- |
| *SRS* | This field is optionally present, need OP, if *srs-SubframeConfig* is broadcasted.  Otherwise, the IE is not present. |

#### – *PDCP-Config-NB*

The IE *PDCP-Config-NB* is used to set the configurable PDCP parameters for data radio bearers.

*PDCP-Config-NB* information element

-- ASN1START

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

discardTimer-r13 ENUMERATED {

ms5120, ms10240, ms20480, ms40960,

ms81920, infinity, spare2, spare1

} OPTIONAL, -- Cond Setup

headerCompression-r13 CHOICE {

notUsed NULL,

rohc SEQUENCE {

maxCID-r13 INTEGER (1..16383) DEFAULT 15,

profiles-r13 SEQUENCE {

profile0x0002 BOOLEAN,

profile0x0003 BOOLEAN,

profile0x0004 BOOLEAN,

profile0x0006 BOOLEAN,

profile0x0102 BOOLEAN,

profile0x0103 BOOLEAN,

profile0x0104 BOOLEAN

},

...

}

},

...,

[[ cipheringDisabled-r16 ENUMERATED {true} OPTIONAL -- Cond ConnectedTo5GC

]]

}

-- ASN1STOP

| *PDCP-Config-NB* field descriptions |
| --- |
| ***cipheringDisabled***  If included, ciphering is disabled for this DRB regardless of which ciphering algorithm is configured for the SRB/DRBs. E-UTRAN may include this field only when the UE is connected to 5GC. The value for this field cannot be changed after the DRB is set up. |
| ***discardTimer***  Indicates the discard timer value specified in TS 36.323 [8]. Value in milliseconds. Value ms5120 means 5120 ms, ms10240 means 10240 ms and so on. |
| ***headerCompression***  E-UTRAN does not reconfigure header compression except optionally upon RRC Connection Resumption. |
| ***maxCID***  Indicates the value of the MAX\_CID parameter as specified in TS 36.323 [8]. The total value of MAX\_CIDs across all bearers for the UE should be less than or equal to the value of *maxNumberROHC-ContextSessions* parameter as indicated by the UE. |
| ***profiles***  The profiles used by both compressor and decompressor in both UE and E-UTRAN. The field indicates which of the ROHC profiles specified in TS 36.323 [8] are supported, i.e. value *true* indicates that the profile is supported. Profile 0x0000 shall always be supported when the use of ROHC is configured. If support of two ROHC profile identifiers with the same 8 LSB's is signalled, only the profile corresponding to the highest value shall be applied. |

| Conditional presence | Explanation |
| --- | --- |
| *ConnectedTo5GC* | The field is optionally present, need OR, if the UE is connected to 5GC. Otherwise the field is not present and the UE shall delete any existing value for this field. |
| *Setup* | The field is mandatory present in case of radio bearer setup. Otherwise the field is optionally present, need ON. |

#### – *PhysicalConfigDedicated-NB*

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

*PhysicalConfigDedicated-NB* information element

-- ASN1START

PhysicalConfigDedicated-NB-r13 ::= SEQUENCE {

carrierConfigDedicated-r13 CarrierConfigDedicated-NB-r13 OPTIONAL, -- Need ON

npdcch-ConfigDedicated-r13 NPDCCH-ConfigDedicated-NB-r13 OPTIONAL, -- Need ON

npusch-ConfigDedicated-r13 NPUSCH-ConfigDedicated-NB-r13 OPTIONAL, -- Need ON

uplinkPowerControlDedicated-r13 UplinkPowerControlDedicated-NB-r13 OPTIONAL, -- Need ON

...,

[[ twoHARQ-ProcessesConfig-r14 ENUMERATED {true} OPTIONAL -- Need OR

]],

[[ interferenceRandomisationConfig-r14 ENUMERATED {true} OPTIONAL -- Need OR

]],

[[ npdcch-ConfigDedicated-v1530 NPDCCH-ConfigDedicated-NB-v1530 OPTIONAL -- Cond TDD

]],

[[ additionalTxSIB1-Config-v1540 ENUMERATED {true} OPTIONAL -- Cond additionalSIB1

]],

[[ npusch-ConfigDedicated-v1610 NPUSCH-ConfigDedicated-NB-v1610

OPTIONAL, -- Cond twoHARQ

npdsch-ConfigDedicated-r16 NPDSCH-ConfigDedicated-NB-r16

OPTIONAL, -- Need ON

resourceReservationConfigDL-r16 SetupRelease {ResourceReservationConfig-NB-r16}

OPTIONAL, -- Cond dl-NonAnchor

resourceReservationConfigUL-r16 SetupRelease {ResourceReservationConfig-NB-r16}

OPTIONAL -- Cond ul-NonAnchor

]],

[[ ntn-ConfigDedicated-r17 SEQUENCE {

npusch-TxDuration-r17 SetupRelease {NPUSCH-TxDuration-NB-r17}

} OPTIONAL, -- Cond NTN

npdsch-ConfigDedicated-v1700 SetupRelease {NPDSCH-16QAM-Config-NB-r17} OPTIONAL, -- Need ON

uplinkPowerControlDedicated-v1700 UplinkPowerControlDedicated-NB-v1700 OPTIONAL -- Cond npusch-16QAM

]]

}

-- ASN1STOP

| *PhysicalConfigDedicated-NB* field descriptions |
| --- |
| ***additionalTxSIB1-Config***  Indicates if subframe #3 not containing additional SIB1 transmission is a NB-IoT DL subframe, as specified in TS 36.213 [23], clause 16.4. |
| ***carrierConfigDedicated***  Anchor/ non-anchor carrier used for all unicast transmissions. |
| ***interferenceRandomisationConfig***  For FDD: Interference randomisation enabled in connected mode, except for random access procedure in connected mode, see TS 36.211 [21]. For random access in connected mode interference randomisation on non-anchor is used and is not used on anchor carrier, see TS 36.211 [21].  For TDD: the parameter is not present. |
| *npdcch-ConfigDedicated*  NPDCCH configuration. |
| *npdsch-ConfigDedicated*  NPDSCH configuration. |
| ***npusch-ConfigDedicated***  UL unicast configuration. |
| ***resourceReservationConfigDL***  Configuration of downlink reserved resources, e.g. for NB-IoT co-existence with NR, see TS 36.211 [21], TS 36.212 [22], and TS 36.213 [23]. |
| ***resourceReservationConfigUL***  Configuration of uplink reserved resources, e.g. for NB-IoT co-existence with NR, see TS 36.211 [21], TS 36.212 [22], and TS 36.213 [23]. |
| ***twoHARQ-ProcessesConfig***  Activation of two HARQ processes, see TS 36.212 [22] and TS 36.213 [23]. |
| ***uplink-PowerControlDedicated***  UL power control parameter. |

| Conditional presence | Explanation |
| --- | --- |
| *additionalSIB1* | This field is optionally present, Need OR, if *additionalTransmissionSIB1* is set to TRUE in *MasterInformationBlock-NB*; otherwise it is not present. |
| *dl-NonAnchor* | The field is optionally present, Need ON, for a DL non-anchor carrier; otherwise the field is not present and the UE shall delete any existing value for this field. |
| *npusch-16QAM* | This field is mandatory present, if *npusch-16QAM-Config-r17* is true; otherwise the field is not present and the UE shall delete any existing value for this field. |
| *NTN* | The field is optionally present, Need ON, for NTN. Otherwise, the field is not present and the UE shall delete any existing value for this field. |
| *TDD* | The field is optionally present, Need OR, for TDD; otherwise the field is not present and the UE shall delete any existing value for this field. |
| *twoHARQ* | The field is optionally present, Need OR, if *twoHARQ-ProcessesConfig* is configured; otherwise the field is not present and the UE shall delete any existing value for this field. |
| *ul-NonAnchor* | The field is optionally present, Need ON, for an UL non-anchor carrier; otherwise the field is not present and the UE shall delete any existing value for this field. |

#### – *PUR-Config-NB*

The IE *PUR-Config-NB* is used to specify PUR configuration.

*PUR-Config-NB* information element

-- ASN1START

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

pur-ConfigID-r16 PUR-ConfigID-NB-r16 OPTIONAL, --Need OR

pur-TimeAlignmentTimer-r16 INTEGER (1..8) OPTIONAL, --Need OR

pur-NRSRP-ChangeThreshold-r16 SetupRelease {PUR-NRSRP-ChangeThreshold-NB-r16}

OPTIONAL, --Need ON

pur-ImplicitReleaseAfter-r16 ENUMERATED {n2, n4, n8, spare} OPTIONAL, --Need OR

pur-RNTI-r16 C-RNTI OPTIONAL, --Need ON

pur-ResponseWindowTimer-r16 ENUMERATED {pp1, pp2, pp3, pp4, pp8, pp16, pp32, pp64}

OPTIONAL, --Need ON

pur-StartTimeParameters-r16 SEQUENCE {

periodicityAndOffset-r16 PUR-PeriodicityAndOffset-NB-r16,

startSFN-r16 INTEGER (0..1023),

startSubframe-r16 INTEGER (0..9),

hsfn-LSB-Info-r16 BIT STRING (SIZE(1))

} OPTIONAL, --Need ON

pur-NumOccasions-r16 ENUMERATED {one, infinite},

pur-PhysicalConfig-r16 SEQUENCE {

carrierConfig-r16 CarrierConfigDedicated-NB-r13,

npusch-NumRUsIndex-r16 INTEGER (0..7),

npusch-NumRepetitionsIndex-r16 INTEGER (0..7),

npusch-SubCarrierSetIndex-r16 CHOICE {

khz15 INTEGER (0..18),

khz3dot75 INTEGER (0..47)

},

npusch-MCS-r16 CHOICE {

singleTone INTEGER (0..10),

multiTone INTEGER (0..13)

},

p0-UE-NPUSCH-r16 INTEGER (-8..7),

alpha-r16 ENUMERATED {al0, al04, al05, al06,

al07, al08, al09, al1},

npusch-CyclicShift-r16 ENUMERATED {n0, n6},

npdcch-Config-r16 NPDCCH-ConfigDedicated-NB-r13

} OPTIONAL, -- Need ON

...,

[[

pur-PhysicalConfig-v1650 SEQUENCE {

ack-NACK-NumRepetitions-r16 ACK-NACK-NumRepetitions-NB-r13

} OPTIONAL --Need ON

]],

[[

pur-PhysicalConfig-v1700 SEQUENCE {

pur-UL-16QAM-Config-r17 SetupRelease {PUR-UL-16QAM-Config-NB-r17} OPTIONAL, -- Need ON

pur-DL-16QAM-Config-r17 SetupRelease {NPDSCH-16QAM-Config-NB-r17} OPTIONAL -- Need ON

} OPTIONAL -- Need ON

]]

}

PUR-NRSRP-ChangeThreshold-NB-r16 ::= SEQUENCE {

increaseThresh-r16 NRSRP-ChangeThresh-NB-r16,

decreaseThresh-r16 NRSRP-ChangeThresh-NB-r16 OPTIONAL --Need OP

}

PUR-UL-16QAM-Config-NB-r17 ::= SEQUENCE {

uplinkPowerControlDedicated-r17 UplinkPowerControlDedicated-NB-v1700

}

NRSRP-ChangeThresh-NB-r16 ::= ENUMERATED {dB4, dB6, dB8, dB10, dB14, dB18, dB22, dB26, dB30, dB34, spare6, spare5, spare4, spare3, spare2, spare1}

-- ASN1STOP

| *PUR-Config-NB* field descriptions |
| --- |
| ***ack-NACK-NumRepetitions***  Number of repetitions for the ACK NACK resource unit carrying HARQ response to NPDSCH, see TS 36.213 [23], clause 16.4.2. If this field is absent and no value was configured via *pur-Config*, the value of *ack-NACK-NumRepetitions* used for HARQ response to NPDSCH containing this *RRCConnectionRelease-NB* message applies. |
| ***alpha***  Parameter: *αc*(3). See TS 36.213 [23], clause 16.2.1.1.1. |
| ***carrierConfig***  Carrier used for PUR. |
| ***hsfn-LSB-Info***  LSB of the H-SFN corresponding to the last subframe of the first transmission of *RRCConnectionRelease* message containing *pur-Config*. |
| ***npdcch-Config***  NPDCCH configuration for PUR. |
| ***npusch-CyclicShift***  Parameter: . See TS 36.211 [21], clause 10.1.4.1.2. Value *n0* corresponds to value 0 and value *n6* corresponds to value 6. |
| ***npusch-MCS***  Index to tables specified in TS 36.213 [23], Table 16.5.1.2-1 and Table 16.5.1.2-2 for single tone and multi tone respectively, that defines modulation and TBS index for NPUSCH for PUR. In case of 16-QAM UL for PUR is configured, *multiTone* index is used, for the guardband and standalone modes the 16-QAM MCS index is equal to the value of *multiTone* + 14, for the inband mode the 16-QAM MCS index is equal to the value of *multiTone* + 11. |
| ***npusch-NumRepetitionsIndex***  Index to a table specified in TS 36.213 [23], Table 16.5.1.1-3, that defines number of repetitions for NPUSCH for PUR. |
| ***npusch-NumRUsIndex***  Index to a table specified in TS 36.213 [23], Table 16.5.1.1-2, that defines number of resource units for NPUSCH for PUR. |
| ***npusch-SubCarrierSetIndex***  For NPUSCH transmission with subcarrier spacing 3.75 kHz, indicates the subcarrier used for PUR specified in TS 36.213 [23].  For NPUSCH transmission with subcarrier spacing 15 kHz, index to a table specified in TS 36.213 [23], Table 16.5.1.1-1, that defines the set of subcarriers for NPUSCH for PUR. |
| ***p0-UE-NPUSCH***  Parameter: . See TS 36.213 [23], clause 16.2.1.1.1, unit dB. |
| ***pur-ImplicitReleaseAfter***  Number of consecutive PUR occasions that can be skipped before implicit release of PUR configuration. Value *n2* corresponds to 2 PUR occasions, value *n4* corresponds to 4 PUR occasions, and so on. |
| ***pur-NRSRP-ChangeThreshold***  Threshold(s) of change in serving cell NRSRP in dB for TA validation. Value *dB4* corresponds to 4 dB, value *dB6* corresponds to 6 dB, and so on. When *pur-NRSRP-ChangeThreshold* is set to *setup*, if *decreaseThrsh* is absent the value of *increaseThresh* is also used for *decreaseThresh*. |
| ***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-PeriodicityAndOffset***  Indicates the periodicity for the PUR occasions and time offset until the first PUR occasion. |
| ***pur-ResponseWindowTimer***  Duration of the PUR response window in TS 36.321 [6]. Value in PDCCH periods. Value *pp2* corresponds to 2 PDCCH periods, *pp3* corresponds to 3 PDCCH periods, and so on.  The value considered by the UE is: *pur-ResponseWindowTimer* = Min (signaled value x PDCCH period, 10.24s). |
| ***pur-TimeAlignmentTimer***  Value of the time alignment timer for PUR. Value in number of periodicity of PUR. |
| ***pur-UL-16QAM-Config***  Configures 16-QAM for uplink. |

#### – *PUR-ConfigID-NB*

The IE *PUR-ConfigID-NB* is used to indicate the PUR configuration identity.

*PUR-ConfigID-NB* information element

-- ASN1START

PUR-ConfigID-NB-r16 ::= BIT STRING (SIZE(20))

-- ASN1STOP

#### – *PUR-PeriodicityAndOffset-NB*

The IE *PUR-PeriodicityAndOffset* is used to indicate H-SFN of the first PUR occasion and periodicity of the subsequent PUR occasions. The value of periodicity is in the unit of H-SFN duration (i.e., 10.24s). Value *periodicity8* corresponds to periodicity of 8 H-SFN, value *periodicity16* corresponds to periodicity of 16 H-SFN and so on. The value of offset is in the unit of H-SFN duration (i.e., 10.24s).

*PUR-PeriodicityAndOffset-NB* information element

-- ASN1START

PUR-PeriodicityAndOffset-NB-r16 ::= CHOICE {

periodicity8 INTEGER (1..7),

periodicity16 INTEGER (1..15),

periodicity32 INTEGER (1..31),

periodicity64 INTEGER (1..63),

periodicity128 INTEGER (1..127),

periodicity256 INTEGER (1..257),

periodicity512 INTEGER (1..511),

periodicity1024 INTEGER (1..1023),

periodicity2048 INTEGER (1..2047),

periodicity4096 INTEGER (1..4095),

periodicity8192 INTEGER (1..8191)

}

-- ASN1STOP

#### – *RACH-ConfigCommon-NB*

The IE *RACH-ConfigCommon-NB* is used to specify the generic random access parameters.

*RACH-ConfigCommon-NB* information element

-- ASN1START

RACH-ConfigCommon-NB-r13 ::= SEQUENCE {

preambleTransMax-CE-r13 PreambleTransMax,

powerRampingParameters-r13 PowerRampingParameters,

rach-InfoList-r13 RACH-InfoList-NB-r13,

connEstFailOffset-r13 INTEGER (0..15) OPTIONAL, -- Need OP

...,

[[ powerRampingParameters-v1450 PowerRampingParameters-NB-v1450 OPTIONAL -- Need OR

]],

[[ rach-InfoList-v1530 RACH-InfoList-NB-v1530 OPTIONAL -- Cond EDT

]]

}

RACH-InfoList-NB-r13 ::= SEQUENCE (SIZE (1.. maxNPRACH-Resources-NB-r13)) OF RACH-Info-NB-r13

RACH-InfoList-NB-v1530 ::= SEQUENCE (SIZE (1.. maxNPRACH-Resources-NB-r13)) OF RACH-Info-NB-v1530

RACH-Info-NB-r13 ::= SEQUENCE {

ra-ResponseWindowSize-r13 ENUMERATED {

pp2, pp3, pp4, pp5, pp6, pp7, pp8, pp10},

mac-ContentionResolutionTimer-r13 ENUMERATED {

pp1, pp2, pp3, pp4, pp8, pp16, pp32, pp64}

}

RACH-Info-NB-v1530 ::= SEQUENCE {

mac-ContentionResolutionTimer-r15 ENUMERATED {

pp1, pp2, pp3, pp4, pp8, pp16, pp32, pp64}

}

PowerRampingParameters-NB-v1450 ::= SEQUENCE {

preambleInitialReceivedTargetPower-v1450 ENUMERATED {

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

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

OPTIONAL, -- Need OR

powerRampingParametersCE1-r14 SEQUENCE {

powerRampingStepCE1-r14 ENUMERATED {dB0, dB2, dB4, dB6},

preambleInitialReceivedTargetPowerCE1-r14 ENUMERATED {

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

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

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

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

dBm-90, dBm-88, dBm-86, dBm-84, dBm-82, dBm-80}

} OPTIONAL -- Need OR

}

-- ASN1STOP

| *RACH-ConfigCommon-NB* field descriptions |
| --- |
| ***connEstFailOffset***  Parameter "Qoffsettemp" in TS 36.304 [4]. If the field is not present the value of infinity shall be used for "Qoffsettemp". |
| ***mac-ContentionResolutionTimer***  Timer for contention resolution in TS 36.321 [6]. Value in PDCCH periods. Value pp1 corresponds to 1 PDCCH period, pp2 corresponds to 2 PDCCH periods and so on. *mac-ContentionResolutionTimer-r15* is only applicable for EDT. UE performing EDT shall use *mac-ContentionResolutionTimer-r15*, if present.  For FDD: The value considered by the UE is: *mac-ContentionResolutionTimer* = Min (signaled value x PDCCH period, 10.24s).  For TDD: The value considered by the UE is: *mac-ContentionResolutionTimer* = Min (signaled value x PDCCH period, 20.48s). |
| ***powerRampingParameters, powerRampingParametersCE1***  Power ramping step and preamble initial received target power – same as TS 36.213 [23] and TS 36.321 [6].  For FDD, if the UE does not support enhanced random access power control and more than one repetition level is configured in the cell, then the UE transmits NPRACH with max power except for the lowest repetition level. Otherwise, the UE uses NPRACH power ramping.  For FDD, if the UE supports enhanced random access power control and *powerRampingParameters-v1450* is signalled, or for TDD, the UE uses NPRACH power ramping across repetition levels as specified in TS 36.321 [6]. If *preambleInitialReceivedTargetPower-v1450* is present, the UE shall use *preambleInitialReceivedTargetPower-v1450* instead of *preambleInitialReceivedTargetPower* (i.e. without suffix). If *powerRampingParametersCE1* is present, the UE shall use *powerRampingParametersCE1* instead of *powerRampingParameters* for NPRACH power ramping in the second repetition level. |
| ***preambleTransMax-CE***  Maximum number of preamble transmission in TS 36.321 [6]. Value is an integer. |
| ***ra-ResponseWindowSize***  Duration of the RA response window in TS 36.321 [6]. Value in PDCCH periods. Value pp2 corresponds to 2 PDDCH periods, pp3 corresponds to 3 PDCCH periods and so on.  For FDD: The value considered by the UE is: *ra-ResponseWindowSize* = Min (signaled value x PDCCH period, 10.24s).  For TDD: The value considered by the UE is: *ra-ResponseWindowSize* = Min (signaled value x PDCCH period, 20.48s). |

| 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. |

#### – *RadioResourceConfigCommonSIB-NB*

The IE *RadioResourceConfigCommonSIB-NB* is used to specify common radio resource configurations in the system information, e.g., the random access parameters and the static physical layer parameters.

*RadioResourceConfigCommonSIB-NB* information element

-- ASN1START

RadioResourceConfigCommonSIB-NB-r13 ::= SEQUENCE {

rach-ConfigCommon-r13 RACH-ConfigCommon-NB-r13,

bcch-Config-r13 BCCH-Config-NB-r13,

pcch-Config-r13 PCCH-Config-NB-r13,

nprach-Config-r13 NPRACH-ConfigSIB-NB-r13,

npdsch-ConfigCommon-r13 NPDSCH-ConfigCommon-NB-r13,

npusch-ConfigCommon-r13 NPUSCH-ConfigCommon-NB-r13,

dl-Gap-r13 DL-GapConfig-NB-r13 OPTIONAL, -- Need OP

uplinkPowerControlCommon-r13 UplinkPowerControlCommon-NB-r13,

...,

[[ nprach-Config-v1330 NPRACH-ConfigSIB-NB-v1330 OPTIONAL -- Need OR

]],

[[ nprach-Config-v1450 NPRACH-ConfigSIB-NB-v1450 OPTIONAL -- Cond EnhPowerControl

]],

[[ nprach-Config-v1530 NPRACH-ConfigSIB-NB-v1530 OPTIONAL, -- Need OR

dl-Gap-v1530 DL-GapConfig-NB-v1530 OPTIONAL, -- Cond TDD

wus-Config-r15 WUS-Config-NB-r15 OPTIONAL -- Need OR

]],

[[ nprach-Config-v1550 NPRACH-ConfigSIB-NB-v1550 OPTIONAL -- Cond TDD1

]],

[[

gwus-Config-r16 GWUS-Config-NB-r16 OPTIONAL, -- Need OR

nrs-NonAnchorConfig-r16 ENUMERATED {true} OPTIONAL, -- Need OR

ue-SpecificDRX-CycleMin-r16 ENUMERATED {rf32, rf64, rf128, rf256, rf512,

rf1024} OPTIONAL -- Need OR

]],

[[ ntn-ConfigCommon-r17 SEQUENCE {

ta-Report-r17 ENUMERATED {enabled} OPTIONAL, -- Need OR

t318-r17 ENUMERATED {

ms0, ms200, ms500, ms1000, ms2000, ms4000, ms8000},

nprach-TxDurationFmt01-r17 NPRACH-TxDurationFmt01-NB-r17 OPTIONAL, -- Need OR

nprach-TxDurationFmt2-r17 NPRACH-TxDurationFmt2-NB-r17 OPTIONAL, -- Need OR

npusch-TxDuration-r17 NPUSCH-TxDuration-NB-r17 OPTIONAL -- Need OR

} OPTIONAL -- Need OR

]]

}

BCCH-Config-NB-r13 ::= SEQUENCE {

modificationPeriodCoeff-r13 ENUMERATED {n16, n32, n64, n128}

}

PCCH-Config-NB-r13 ::= SEQUENCE {

defaultPagingCycle-r13 ENUMERATED {rf128, rf256, rf512, rf1024},

nB-r13 ENUMERATED {

fourT, twoT, oneT, halfT, quarterT, one8thT,

one16thT, one32ndT, one64thT,

one128thT, one256thT, one512thT, one1024thT,

spare3, spare2, spare1},

npdcch-NumRepetitionPaging-r13 ENUMERATED {

r1, r2, r4, r8, r16, r32, r64, r128,

r256, r512, r1024, r2048,

spare4, spare3, spare2, spare1}

}

-- ASN1STOP

| *RadioResourceConfigCommonSIB-NB* field descriptions |
| --- |
| ***defaultPagingCycle***  Default paging cycle, used to derive 'T' in TS 36.304 [4]. Value *rf128* corresponds to 128 radio frames, *rf256* corresponds to 256 radio frames and so on. |
| ***dl-Gap***  Downlink transmission gap configuration for the anchor carrier. See TS 36.211 [21], clause 10.2.3.4. If the field is absent, there is no gap. |
| ***gwus-Config***  For FDD: GWUS Configuration. |
| ***modificationPeriodCoeff***  Actual modification period, expressed in number of radio frames= *modificationPeriodCoeff* \* *defaultPagingCycle*. n16 corresponds to value 16, n32 corresponds to value 32, and so on. The BCCH modification period should be larger or equal to 40.96s. |
| ***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. |
| ***npdcch-NumRepetitionPaging***  Maximum number of repetitions for NPDCCH common search space (CSS) for paging, see TS 36.213 [23], clause 16.6. |
| ***nrs-NonAnchorConfig***  For FDD: Indicates if NRS are present on non-anchor paging carriers even when no paging NPDCCH is transmitted, see TS 36.211 [21], clause 10.2.6. |
| ***ta-Report***  Indicates whether UE specific TA reporting is enabled as specified in TS 36.321 [6]. | |
| ***t318***  The value of timer T318. Value *ms0* corresponds with 0 ms, *ms50* corresponds with 50 ms and so on. | |
| ***ue-SpecificDRX-CycleMin***  Minimum UE specific DRX cycle in the cell, see TS 36.304 [4], clause 7.1. Value *rf32* corresponds to 32 radio frames, *rf64* corresponds to 64 radio frames and so on.  If present, E-UTRAN ensures PCCH configuration does not lead to CSS overlap for *ue-SpecificDRX-CycleMin*.  If the field is not present, use of UE specific DRX cycle is not allowed in the cell. |
| ***wus-Config***  For FDD: WUS Configuration. |

| Conditional presence | Explanation |
| --- | --- |
| *EnhPowerControl* | This field is optional present, Need OR, if *PowerRampingParameters-NB-v1450* is included in SIB2-NB. Otherwise the field is not present. |
| *TDD* | The field is optionally present, Need OR, for TDD; otherwise the field is not present and the UE shall delete any existing value for this field. |
| *TDD1* | The field is mandatory present for TDD; otherwise the field is not present and the UE shall delete any existing value for this field. |

#### – *RadioResourceConfigDedicated-NB*

The IE *RadioResourceConfigDedicated-NB* is used to setup/modify/release RBs, to modify the MAC main configuration, and to modify dedicated physical configuration.

*RadioResourceConfigDedicated-NB* information element

-- ASN1START

RadioResourceConfigDedicated-NB-r13 ::= SEQUENCE {

srb-ToAddModList-r13 SRB-ToAddModList-NB-r13 OPTIONAL, -- Need ON

drb-ToAddModList-r13 DRB-ToAddModList-NB-r13 OPTIONAL, -- Need ON

drb-ToReleaseList-r13 DRB-ToReleaseList-NB-r13 OPTIONAL, -- Need ON

mac-MainConfig-r13 CHOICE {

explicitValue-r13 MAC-MainConfig-NB-r13,

defaultValue-r13 NULL

} OPTIONAL, -- Need ON

physicalConfigDedicated-r13 PhysicalConfigDedicated-NB-r13 OPTIONAL, -- Need ON

rlf-TimersAndConstants-r13 RLF-TimersAndConstants-NB-r13 OPTIONAL, -- Need ON

...,

[[ schedulingRequestConfig-r15 SchedulingRequestConfig-NB-r15 OPTIONAL -- Need ON

]],

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

]]

}

SRB-ToAddModList-NB-r13 ::= SEQUENCE (SIZE (1)) OF SRB-ToAddMod-NB-r13

SRB-ToAddMod-NB-r13 ::= SEQUENCE {

rlc-Config-r13 CHOICE {

explicitValue RLC-Config-NB-r13,

defaultValue NULL

} OPTIONAL, -- Cond Setup

logicalChannelConfig-r13 CHOICE {

explicitValue LogicalChannelConfig-NB-r13,

defaultValue NULL

} OPTIONAL, -- Cond Setup

...,

[[ rlc-Config-v1430 RLC-Config-NB-v1430 OPTIONAL -- Need ON

]],

[[ rlc-Config-v1700 RLC-Config-NB-v1700 OPTIONAL -- Need ON

]]

}

DRB-ToAddModList-NB-r13 ::= SEQUENCE (SIZE (1..maxDRB-NB-r13)) OF DRB-ToAddMod-NB-r13

DRB-ToAddMod-NB-r13 ::= SEQUENCE {

eps-BearerIdentity-r13 INTEGER (0..15) OPTIONAL, -- Cond DRB-Setup-EPC

drb-Identity-r13 DRB-Identity,

pdcp-Config-r13 PDCP-Config-NB-r13 OPTIONAL, -- Cond Setup

rlc-Config-r13 RLC-Config-NB-r13 OPTIONAL, -- Cond Setup

logicalChannelIdentity-r13 INTEGER (3..10) OPTIONAL, -- Cond DRB-Setup

logicalChannelConfig-r13 LogicalChannelConfig-NB-r13 OPTIONAL, -- Cond Setup

...,

[[ rlc-Config-v1430 RLC-Config-NB-v1430 OPTIONAL -- Need ON

]],

[[ pdu-Session-r16 PDU-SessionID-NB-r16 OPTIONAL -- Cond DRB-Setup-5GC

]],

[[ rlc-Config-v1700 RLC-Config-NB-v1700 OPTIONAL -- Need ON

]]

}

PDU-SessionID-NB-r16 ::= INTEGER (0..255)

DRB-ToReleaseList-NB-r13 ::= SEQUENCE (SIZE (1..maxDRB-NB-r13)) OF DRB-Identity

-- ASN1STOP

| *RadioResourceConfigDedicated-NB* field descriptions |
| --- |
| ***logicalChannelConfig***  For SRB 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. |
| ***logicalChannelIdentity***  The logical channel identity for both UL and DL for a DRB. Value 3 is not used. |
| ***mac-MainConfig***  The default MAC MAIN configuration is specified in 9.2.2. |
| ***newUE-Identity***  C-RNTI used after moving to RRC\_CONNECTED in response to transmission using PUR. |
| ***pdu-Session***  Identity of the PDU session whose QoS flow is mapped to the DRB. |
| ***physicalConfigDedicated***  The default dedicated physical configuration is specified in 9.2.4. |
| ***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. RLC AM is the only applicable RLC mode for SRB1 and SRB1bis. |
| ***schedulingRequestConfig***  For FDD: Scheduling request configuration. |

| **Conditional presence** | **Explanation** |
| --- | --- |
| *DRB-Setup* | The field is mandatory present if the corresponding DRB is being set up; otherwise it is not present. |
| *DRB-Setup-5GC* | The field is mandatory present if the corresponding DRB is being set up when connected to 5GC; otherwise it is not present. |
| *DRB-Setup-EPC* | The field is mandatory present if the corresponding DRB is being set up when connected to EPC; 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. |

#### – *ResourceReservationConfig-NB*

The IE *ResourceReservationConfig-NB* is used to specify the reserved downlink or uplink resources on a NB-IoT carrier, e.g. for deployment within a NR carrier.

*ResourceReservationConfig-NB* information element

-- ASN1START

ResourceReservationConfig-NB-r16::= SEQUENCE {

periodicity-r16 ENUMERATED {ms10, ms20, ms40, ms80, ms160, spare3, spare2, spare1},

startPosition-r16 INTEGER (0..15),

resourceReservation-r16 CHOICE {

subframeBitmap-r16 CHOICE {

subframePattern10ms BIT STRING (SIZE (10)),

subframePattern40ms BIT STRING (SIZE (40))

},

slotConfig-r16 SEQUENCE {

slotBitmap-r16 CHOICE {

slotPattern10ms BIT STRING (SIZE (20)),

slotPattern40ms BIT STRING (SIZE (80))

},

symbolBitmap-r16 CHOICE {

symbolBitmapFddDl SEQUENCE {

symbolBitmap1-r16 BIT STRING (SIZE (5)) OPTIONAL, -- Cond Bitmap1

symbolBitmap2-r16 BIT STRING (SIZE (5)) OPTIONAL -- Cond Bitmap2

},

symbolBitmapFddUlOrTdd SEQUENCE {

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

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

}

}

}

},

...

}

-- ASN1STOP

| *ResourceReservationConfig* field descriptions |
| --- |
| ***periodicity***  Periodicity of the reserved resource. Value *ms10* corresponds to 10 milliseconds, value *ms20* corresponds to 20 milliseconds, and so on. |
| ***slotPattern10ms, slotPattern40ms***  For FDD: Downlink slot-level resource reservation configuration over 10ms or 40ms.  Parameter slot-reserved-resource-config-DL in TS 36.211 [21] and TS 36.213 [23]  The first/leftmost 2-bits corresponds to the subframe #0 of the radio frame satisfying SFN mod x = *startPosition*, where x is the periodicity of the reserved resource divided by 10. 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 |
| ***startPosition***  Start time of the resource reservation pattern in one period. Unit in multiple of 10 milliseconds.  E-UTRAN configures the value of *startPosition* such as *startPosition \* 10 < periodicity.* |
| ***subframePattern10ms, subframePattern40ms***  For FDD: Downlink subframe-level resource reservation configuration over 10ms or 40ms.  Parameters valid-subframe-config-DL in TS 36.211 [21] and TS 36.213 [23].  The first/leftmost bit corresponds to the subframe #0 of the radio frame satisfying SFN mod x = *startPosition*, where x is the periodicity of the reserved resource divided by 10. Value 0 indicates that the corresponding subframe is not reserved, value 1 indicates that the corresponding subframe is reserved. |
| ***symbolBitmap***  Symbol-level resource reservation for one subframe*.*  E-UTRAN configures *symbolConfigFddDl* for a DL FDD NB-IoT carrier. E-UTRAN configures *symbolConfigFddULOrTdd* for an UL FDD NB-IoT carrier or a TDD NB-IoT carrier. |
| ***symbolBitmap1, symbolBitmap2***  Symbol-level resource reservation over the first or the second slot of one subframe, see TS 36.211 [21].  The first/leftmost bit corresponds to the symbol #0 in the slot. Value 0 indicates that the corresponding symbol is not reserved, value 1 indicates that the corresponding symbol is reserved.  If *symbolBitmap1* is absent, value '01' in the *slotBitmap* corresponds to the second slot being reserved.  If *symbolBitmap2* is absent, value '10' in the *slotBitmap* corresponds to the first slot being reserved. | |
| ***symbolBitmapFddDl***  For FDD: Downlink symbol-level resource reservation over the first and the second slot of one subframe, see TS 36.211 [21].  Symbols that carry NRS are not reserved. |
| ***symbolBitmapFddUlOrTdd***  For FDD: Uplink symbol-level resource reservation over the first and the second slot of one subframe, see TS 36.211 [21].  For TDD: Uplink or downlink symbol-level resource reservation over the first and the second slot of one subframe, see TS 36.211 [21].  Symbols that carry NRS are not reserved. |

| Conditional presence | Explanation | |
| --- | --- | --- |
| *Bitmap1* | The field is optional present, need OR, if value of *slotBitmap* corresponditing to at least one subrame is '01'; otherwise the field is not present. |
| *Bitmap2* | The field is optional present, need OR, if value of *slotBitmap* corresponditing to at least one subrame is '10'; otherwise the field is not present. |

#### – *RLC-Config-NB*

The IE *RLC-Config-NB* is used to specify the RLC configuration of SRBs and DRBs.

*RLC-Config-NB information element*

-- ASN1START

RLC-Config-NB-r13 ::= CHOICE {

am SEQUENCE {

ul-AM-RLC-r13 UL-AM-RLC-NB-r13,

dl-AM-RLC-r13 DL-AM-RLC-NB-r13

},

...,

um-Bi-Directional-r15 NULL,

um-Uni-Directional-UL-r15 NULL,

um-Uni-Directional-DL-r15 NULL

}

RLC-Config-NB-v1430 ::= SEQUENCE {

t-Reordering-r14 T-Reordering OPTIONAL -- Cond twoHARQ

}

RLC-Config-NB-v1700 ::= SEQUENCE {

t-ReorderingExt-r17 SetupRelease {T-ReorderingExt-r17}

}

UL-AM-RLC-NB-r13 ::= SEQUENCE {

t-PollRetransmit-r13 T-PollRetransmit-NB-r13,

maxRetxThreshold-r13 ENUMERATED {t1, t2, t3, t4, t6, t8, t16, t32}

}

DL-AM-RLC-NB-r13 ::= SEQUENCE {

enableStatusReportSN-Gap-r13 ENUMERATED {true} OPTIONAL

}

T-PollRetransmit-NB-r13 ::= ENUMERATED {

ms250, ms500, ms1000, ms2000, ms3000, ms4000,

ms6000, ms10000, ms15000, ms25000, ms40000, ms60000,

ms90000, ms120000, ms180000, ms300000-v1530}

-- ASN1STOP

| *RLC-Config-NB* field descriptions |
| --- |
| ***enableStatusReportSN-Gap***  Indicates that status reporting due to detection of reception failure is enabled, as specified in TS 36.322 [7]. |
| ***maxRetxThreshold***  Parameter for RLC AM in TS 36.322 [7]. Value t1 corresponds to 1 retransmission, t2 to 2 retransmissions and so on. |
| ***t-PollRetransmit***  Timer for RLC AM inTS 36.322 [7], in milliseconds. Value msX means X ms, msY means Y ms and so on.  E-UTRAN may configure the value *msX-v1530* (with suffix) only in TDD mode. |
| ***t-Reordering***  Timer for reordering in TS 36.322 [7], in milliseconds. |
| ***t-ReorderingExt***  Timer for reordering in TS 36.322 [7], in milliseconds.  The UE shall use the extended value *t-ReorderingExt-r17*, if present, and ignore the value signaled by *t-Reordering-r14*.  E-UTRAN may configure *t-ReorderingExt* only if *twoHARQ-ProcessesConfig* is set to TRUE. |

| **Conditional presence** | **Explanation** |
| --- | --- |
| *twoHARQ* | The field is mandatory present if *twoHARQ-ProcessesConfig* is set to TRUE. Otherwise, the field is not present and, if previously configured, the timer is released. |

#### – *RLF-TimersAndConstants-NB*

The IE *RLF-TimersAndConstants-NB* contains UE specific timers and constants applicable for UEs in RRC\_CONNECTED.

*RLF-TimersAndConstants-NB* information element

-- ASN1START

RLF-TimersAndConstants-NB-r13 ::= CHOICE {

release NULL,

setup SEQUENCE {

t301-r13 ENUMERATED {

ms2500, ms4000, ms6000, ms10000,

ms15000, ms25000, ms40000, ms60000},

t310-r13 ENUMERATED {

ms0, ms200, ms500, ms1000, ms2000, ms4000, ms8000},

n310-r13 ENUMERATED {

n1, n2, n3, n4, n6, n8, n10, n20},

t311-r13 ENUMERATED {

ms1000, ms3000, ms5000, ms10000, ms15000,

ms20000, ms30000},

n311-r13 ENUMERATED {

n1, n2, n3, n4, n5, n6, n8, n10},

...,

[[ t311-v1350 ENUMERATED {

ms40000, ms60000, ms90000, ms120000}

OPTIONAL -- Need OR

]],

[[ t301-v1530 ENUMERATED {

ms80000, ms100000, ms120000}

OPTIONAL, -- Cond TDD

t311-v1530 ENUMERATED {

ms160000, ms200000}

OPTIONAL -- Cond TDD

]]

}

}

-- ASN1STOP

| *RLF-TimersAndConstants-NB* field descriptions |
| --- |
| ***n3xy***  Constants are described in clause 7.4. n1 corresponds with 1, n2 corresponds with 2 and so on. |
| ***t3xy***  Timers are described in clause 7.3. Value ms0 corresponds with 0 ms, ms200 corresponds with 200 ms and so on. The UE shall use the extended values *t311-v1350*, *t301-v1530* and *t311-v1530*, if present, and ignore the value signaled by *t311-r13*, *t301-r13* and *t311-r13* respectively. |

|  |  |
| --- | --- |
| Conditional presence | Explanation |
| *TDD* | The field is optionally present, Need OR, in TDD mode. Otherwise, the field is not present. |

#### – *SchedulingRequestConfig-NB*

The IE *SchedulingRequestConfig-NB* is used to specify the Scheduling Request related parameters.

*SchedulingRequestConfig-NB* information element

-- ASN1START

SchedulingRequestConfig-NB-r15 ::= SEQUENCE {

sr-WithHARQ-ACK-Config-r15 ENUMERATED {true} OPTIONAL,

sr-WithoutHARQ-ACK-Config-r15 SR-WithoutHARQ-ACK-Config-NB-r15 OPTIONAL, -- Need ON

sr-SPS-BSR-Config-r15 SR-SPS-BSR-Config-NB-r15 OPTIONAL, -- Need ON

...,

[[ sr-WithoutHARQ-ACK-Config-v1700 SR-WithoutHARQ-ACK-Config-NB-v1700 OPTIONAL -- Need ON

]]

}

SR-WithoutHARQ-ACK-Config-NB-r15 ::= CHOICE {

release NULL,

setup SEQUENCE {

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

sr-NPRACH-Resource-r15 SR-NPRACH-Resource-NB-r15 OPTIONAL -- Need ON

}

}

SR-WithoutHARQ-ACK-Config-NB-v1700 ::= SEQUENCE {

sr-ProhibitTimerOffset-r17 SetupRelease {SR-ProhibitTimerOffset-NB-r17} OPTIONAL -- Need ON

}

SR-NPRACH-Resource-NB-r15 ::= SEQUENCE {

nprach-CarrierIndex-r15 INTEGER (0..maxNonAnchorCarriers-NB-r14),

nprach-ResourceIndex-r15 INTEGER (1..maxNPRACH-Resources-NB-r13),

nprach-SubCarrierIndex-r15 CHOICE {

nprach-Fmt0Fmt1-r15 INTEGER (0..47),

nprach-Fmt2-r15 INTEGER (0..143)

},

p0-SR-r15 INTEGER (-126..24),

alpha-r15 ENUMERATED {al0, al04, al05, al06, al07, al08, al09, al1}}

SR-SPS-BSR-Config-NB-r15 ::= CHOICE {

release NULL,

setup SEQUENCE {

semiPersistSchedC-RNTI-r15 C-RNTI,

semiPersistSchedIntervalUL-r15 ENUMERATED {sf128, sf256, sf512, sf1024,

sf1280, sf2048, sf2560, sf5120}

}

}

SR-ProhibitTimerOffset-NB-r17 ::= ENUMERATED {

ms90, ms180, ms270, ms360, ms450, ms540, ms1080, spare}

-- ASN1STOP

| ***SchedulingRequestConfig-NB* field descriptions** |
| --- |
| ***alpha***  Parameter: *αc*. Fractional power control parameter for SR without HARQ-ACK. See TS 36.213 [23], clause 16.2.1.2.1, where value *al0* corresponds to 0, value *al04* corresponds to 0.4, value *al05* to 0.5, value *al06* to 0.6, value *al07* to 0.7, value *al08* to 0.8, value *al09* to 0.9 and value *al1* corresponds to 1. |
| ***nprach-CarrierIndex***  Index of the carrier in the list of UL non anchor carriers in *SystemInformationBlockType22-NB*. The first entry in the list has index '1', the second entry has index '2' and so on. Value '0' indicates the anchor carrier. |
| ***nprach-ResourceIndex***  Index of the NPRACH resource in the list of NPRACH resources in *NPRACH-ParametersList* or *NPRACH-ParametersList-Fmt2* for the UL carrier indicated by *nprach-CarrierIndex*. The first entry in the list has index '1', the second entry has index '2' and so on.  E-UTRAN configures a NPRACH resource in *NPRACH-ParametersList-Fmt2* only to UEs that have reported support of NPRACH resource Format2. |
| ***nprach-SubCarrierIndex***  Index of the subcarrier in the NPRACH resource in *NPRACH-ParametersList* or or *NPRACH-ParametersList-Fmt2* for the indicated UL carrier.  E-UTRAN does not configure *nprach-SubcarrierIndex* to a smaller value than *nprach-SubcarrierOffset* + *nprach-NumCBRA-StartSubcarriers* for the indicated NPRACH resource. |
| ***p0-SR***  Parameter:. Target power for SR without HARQ-ACK. See TS 36.213 [23], clause 16.2.1.2.1, unit dBm. |
| ***semiPersistSchedC-RNTI***  Semi-persistent Scheduling C-RNTI, see TS 36.321 [6]. |
| ***semiPersistSchedIntervalUL***  Semi-persistent scheduling interval in uplink, see TS 36.321 [6]. Value in number of sub-frames. Value *sf128* corresponds to 128 sub-frames, value *sf256* corresponds to 256 sub-frames and so on. |
| ***sr-SPS-BSR-Config***  Activation of SR with SPS BSR, see TS 36.321 [6].  E-UTRAN cannot configure *sr-SPS-BSR* together with *sr-WithoutHARQ-ACK-Config*. |
| ***sr-NPRACH-Resource***  NPRACH resource for physical layer SR without HARQ-ACK, see TS 36.211 [21] and TS 36.213 [23]. |
| ***sr-ProhibitTimer***  Timer for SR transmission on the NPRACH resource for SR in TS 36.321 [6]. Value in number of SR period, where the SR period is equal to the field *nprach-Periodicity* of the NPRACH resource. 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 period and so on.  If *sr-ProhibitTimerOffset* is present, actual value of *sr-ProhibitTimer* = CEIL (*sr-ProhibitTimerOffset*/ SR period) + signalled value of *sr-ProhibitTimer*. |
| ***sr-ProhibitTimerOffset***  Time offset for SR transmission on the NPRACH resource for SR in TS 36.321 [6]. Value in milliseconds. Value *ms90* corresponds to 90 ms, value *ms180* corresponds to 180 ms and so on. |
| ***sr-WithHARQ-ACK-Config***  Activation of physical layer SR with HARQ ACK, see TS 36.213 [23]. |
| ***sr-WithoutHARQ-ACK-Config***  Activation of physical layer SR without HARQ ACK, see TS 36.211 [21] and TS 36.213 [23].  E-UTRAN cannot configure *sr-WithoutHARQ-ACK-Config* together with *sr-SPS-BSR*. |

#### *– TDD-Config-NB*

The IE *TDD-Config-NB* is used to specify the TDD specific physical channel configuration.

***TDD-Config* information element**

-- ASN1START

TDD-Config-NB-r15 ::= SEQUENCE {

subframeAssignment-r15 ENUMERATED {

sa1, sa2, sa3, sa4, sa5},

specialSubframePatterns-r15 ENUMERATED {

ssp0, ssp1, ssp2, ssp3, ssp4, ssp5, ssp6, ssp7,

ssp8, ssp9, ssp10, ssp10-CRS-LessDwPTS}

}

-- ASN1STOP

| *TDD-Config* field descriptions |
| --- |
| ***specialSubframePatterns***  Indicates Configuration as in TS 36.211 [21], table 4.2-1 where ssp0 points to Configuration 0, ssp1 to Configuration 1 etc. Value *ssp10-CRS-LessDwPTS* corresponds to ssp10 without CRS transmission on the 5th symbol of DwPTS. |
| ***subframeAssignment***  Indicates DL/UL subframe configuration where *sa1* points to Configuration1, *sa2* to Configuration 2 and so on, as specified in TS 36.211 [21], table 4.2-2.  E-UTRAN configures the same value for serving cells residing on same frequency band. |

#### *– TDD-UL-DL-AlignmentOffset-NB*

The IE *TDD-UL-DL-AlignmentOffset-NB* is used to specify the offset between the UL carrier frequency center with respect to DL carrier frequency center. This information should be used to calculate the Mul value, see TS 36.101 [42].

***TDD-UL-DL-AlignmentOffset-NB* information element**

-- ASN1START

TDD-UL-DL-AlignmentOffset-NB-r15 ::= ENUMERATED { khz-7dot5, khz0, khz7dot5}

-- ASN1STOP

#### – *UplinkPowerControl-NB*

The IE *UplinkPowerControlCommon-NB* and IE *UplinkPowerControlDedicated-NB* are used to specify parameters for uplink power control in the system information and in the dedicated signalling, respectively.

*UplinkPowerControl-NB* information elements

-- ASN1START

UplinkPowerControlCommon-NB-r13 ::= SEQUENCE {

p0-NominalNPUSCH-r13 INTEGER (-126..24),

alpha-r13 ENUMERATED {al0, al04, al05, al06, al07, al08, al09, al1},

deltaPreambleMsg3-r13 INTEGER (-1..6)

}

UplinkPowerControlDedicated-NB-r13 ::= SEQUENCE {

p0-UE-NPUSCH-r13 INTEGER (-8..7)

}

UplinkPowerControlDedicated-NB-v1700 ::= SEQUENCE {

deltaMCS-Enabled-r17 ENUMERATED {en0, en1}

}

-- ASN1STOP

| *UplinkPowerControl-NB* field descriptions |
| --- |
| ***alpha***  Parameter: *αc*(1). See TS 36.213 [23], clause 16.2.1.1, where 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. |
| ***deltaMCS-Enabled***  Parameter: *KS*. See TS 36.213 [23], clause 16.2.1.1.1. Value *en0* corresponds to value 0 corresponding to state "disabled" and value *en1* corresponds to value 1.25 corresponding to state "enabled". |
| ***deltaPreambleMsg3***  Parameter: . See TS 36.213 [23], clause 16.2.1.1. Actual value = IE value \* 2 [dB]. |
| ***p0-NominalNPUSCH***  Parameter: . See TS 36.213 [23], clause 16.2.1.1, unit dBm. |
| ***p0-UE-NPUSCH***  Parameter: . See TS 36.213 [23], clause 16.2.1.1, unit dB. |

#### *– WUS-Config-NB*

The IE *WUS-Config-NB* is used to specify the WUS configuration. For 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-NB information element*

-- ASN1START

WUS-Config-NB-r15 ::= SEQUENCE {

maxDurationFactor-r15 WUS-MaxDurationFactor-NB-r15,

numPOs-r15 ENUMERATED {n1, n2, n4} DEFAULT n1,

numDRX-CyclesRelaxed-r15 ENUMERATED {n1, n2, n4, n8},

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-ConfigPerCarrier-NB-r15 ::= SEQUENCE {

maxDurationFactor-r15 WUS-MaxDurationFactor-NB-r15

}

WUS-MaxDurationFactor-NB-r15 ::= ENUMERATED {one128th, one64th, one32th, one16th,

oneEighth, oneQuarter, oneHalf}

-- ASN1STOP

| *WUS-Config-NB* field descriptions |
| --- |
| ***maxDurationFactor***  Maximum WUS duration, expressed as a ratio of Rmax for Type 1-CSS. Value *one128th* means Rmax \* 1/128, value *one64th* means Rmax \* 1/64 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 *npdcch-NumRepetitionPaging* for the carrier. |
| ***numDRX-CyclesRelaxed***  Maximum number of consecutive DRX cycles during which the UE may 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 Wake Up Signal (WUS), applicable to UEs configured to use extended DRX, see TS 36.304 [4]. Value n1 corresponds to 1 PO and value n2 corresponds to 2 POs and so on. |
| ***timeOffsetDRX***  When DRX is used, non-zero gap from the end of the configured maximum WUS duration to the associated PO, see TS 36.304 [4], clause 7.4 and TS 36.211 [21]. In milliseconds. Value *ms40* corresponds to 40ms, value *ms80* corresponds to 80 ms and so on. |
| ***timeOffset-eDRX-Short***  When eDRX is used, the short non-zero gap from the end of the configured maximum WUS duration to the associated PO, see TS 36.304 [4], clause 7.4 and TS 36.211 [21]. In milliseconds. Value *ms40* corresponds to 40ms, 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 from the end of the configured maximum WUS duration to the associated PO, see TS 36.304 [4], clause 7.4 and TS 36.211 [21]. In milliseconds. Value *ms1000* corresponds to 1000 ms, value *ms2000* corresponds to 2000 ms. |

#### 6.7.3.3 NB-IoT Security control information elements

Void

#### 6.7.3.4 NB-IoT Mobility control information elements

#### – *AdditionalBandInfoList-NB*

*AdditionalBandInfoList-NB information element*

-- ASN1START

AdditionalBandInfoList-NB-r14 ::= SEQUENCE (SIZE (1..maxMultiBands)) OF FreqBandIndicator-NB-r13

-- ASN1STOP

#### – *FreqBandIndicator-NB*

The IE *FreqBandIndicator-NB* indicates the E-UTRA operating band as defined in TS 36.101 [42], table 5.5-1.

*FreqBandIndicator-NB information element*

-- ASN1START

FreqBandIndicator-NB-r13 ::= INTEGER (1.. maxFBI2)

-- ASN1STOP

#### – *MultiBandInfoList-NB*

*MultiBandInfoList-NB information element*

-- ASN1START

MultiBandInfoList-NB-r13 ::= SEQUENCE (SIZE (1..maxMultiBands)) OF MultiBandInfo-NB-r13

MultiBandInfo-NB-r13 ::= SEQUENCE {

freqBandIndicator-r13 FreqBandIndicator-NB-r13 OPTIONAL, -- Need OR

freqBandInfo-r13 NS-PmaxList-NB-r13 OPTIONAL -- Need OR

}

-- ASN1STOP

#### *– NS-PmaxList-NB*

The IE *NS-PmaxList-NB* concerns a list of *additionalPmax* and *additionalSpectrumEmission* as defined in TS 36.101 [42], clause 6.2.4F, for a given frequency band. E-UTRAN does not include the same value of *additionalSpectrumEmission* in *SystemInformationBlockType2-NB* within this list.

*NS-PmaxList-NB* information element

-- ASN1START

NS-PmaxList-NB-r13 ::= SEQUENCE (SIZE (1..maxNS-Pmax-NB-r13)) OF NS-PmaxValue-NB-r13

NS-PmaxValue-NB-r13 ::= SEQUENCE {

additionalPmax-r13 P-Max OPTIONAL, -- Need OR

additionalSpectrumEmission-r13 AdditionalSpectrumEmission

}

-- ASN1STOP

#### *– ReselectionThreshold-NB*

The IE *ReselectionThreshold-NB* is used to indicate an Rx level threshold for cell reselection. Actual value of threshold = field value \* 2 [dB].

***ReselectionThreshold-NB* information element**

-- ASN1START

ReselectionThreshold-NB-v1360 ::= INTEGER (32..63)

-- ASN1STOP

#### – *T-Reselection-NB*

The IE *T-Reselection-NB* concerns the cell reselection timer TreselectionRAT for NB-IoT.

Value in seconds. s0 means 0 second and behaviour as specified in 7.3.2 applies, s3 means 3 seconds and so on.

*T-Reselection-NB information element*

-- ASN1START

T-Reselection-NB-r13 ::= ENUMERATED {s0, s3, s6, s9, s12, s15, s18, s21}

-- ASN1STOP

#### 6.7.3.5 NB-IoT Measurement information elements

#### – *ANR-MeasConfig-NB*

The IE *ANR-MeasConfig-NB* is used to convey the configuration of the measurements to be performed by the UE in RRC\_IDLE for ANR.

*ANR-MeasConfig-NB* information element

-- ASN1START

ANR-MeasConfig-NB-r16 ::= SEQUENCE {

anr-QualityThreshold-r16 NRSRP-Range-NB-r14,

anr-CarrierList-r16 ANR-CarrierList-NB-r16,

...

}

ANR-CarrierList-NB-r16 ::= SEQUENCE (SIZE (1..maxFreqANR-NB-r16)) OF ANR-Carrier-NB-r16

ANR-Carrier-NB-r16::= SEQUENCE {

carrierFreqIndex-r16 INTEGER (1..maxFreq),

excludedCellList-r16 ANR-ExcludedCellList-NB-r16 OPTIONAL, -- Need OP

...

}

ANR-ExcludedCellList-NB-r16 ::= SEQUENCE (SIZE (1..maxExcludedCell)) OF PhysCellId

-- ASN1STOP

| *ANR-MeasConfig-NB* field descriptions |
| --- |
| ***anr-CarrierList***  List of NB-IoT carriers to be measured for ANR. |
| ***anr-QualityThreshold***  Indicates the quality threshold for reporting the CGI of the strongest cell. |
| ***carrierFreqIndex***  Index of the carrier frequency in *interFreqCarrierFreqList* in *SystemInformationBlockType5-NB*. |
| ***excludedCellList***  List of exclude-listed neighbouring cells for ANR reporting. |

#### – *ANR-MeasReport-NB*

The IE *ANR-MeasReport-NB* includes the ANR measurements information.

*ANR-MeasReport-NB* information element

-- ASN1START

ANR-MeasReport-NB-r16 ::= SEQUENCE {

servCellIdentity-r16 CellGlobalIdEUTRA OPTIONAL,

measResultServCell-r16 MeasResultServCell-NB-r14,

relativeTimeStamp-r16 INTEGER (0..95),

measResultList-r16 SEQUENCE (SIZE (1..maxFreqANR-NB-r16)) OF ANR-MeasResult-NB-r16,

...

}

ANR-MeasResult-NB-r16 ::= SEQUENCE {

carrierFreq-r16 CarrierFreq-NB-r13,

physCellId-r16 PhysCellId OPTIONAL,

measResultLastServCell-r16 MeasResultServCell-NB-r14,

measResult-r16 NRSRP-Range-NB-r14 OPTIONAL,

cgi-Info-r16 SEQUENCE {

cellGlobalId-r16 CellGlobalIdEUTRA,

trackingAreaCode-r16 TrackingAreaCode,

plmn-IdentityList-r16 PLMN-IdentityList2 OPTIONAL

} OPTIONAL

}

-- ASN1STOP

| *ANR-MeasReport-NB* field descriptions |
| --- |
| ***carrierFreq***  Indicates the carrier frequency of the reported cell. |
| ***cgi-info***  Broadcast information of the reported cell. |
| ***measResult***  Measured result of the reported cell. |
| ***measResultList***  List of measured results for the maximum number of reported carrier frequencies. |
| ***measResultLastServCell***  The last measurement results taken in the serving cell when the measured results of the reported cell is stored. |
| ***measResultServingCell***  Measurement results taken in the serving cell when the configuration of the measurements is received. |
| ***plmn-IdentityList***  The list of PLMN Identity read from the broadcast information of the reported cell. |
| ***relativeTimeStamp***  Indicates the time when the ANR measurements are complete, measured relative to the time when the configuration of the measurements was received. Value in hours. |
| ***servingCellIdentity***  Indicates the cell where the measurement configuration was received.  If the field is absent, it is the same as the current serving cell. |

#### – *CQI-NPDCCH-NB*

The IE *CQI-NPDCCH-NB* represents the downlink channel quality measurement of the NB-IoT carrier where the random access response is received. The codepoints for the CQI-NPDCCH measurements are according to the mapping table in TS 36.133 [16]. The value *noMeasurements* indicates no measurement reporting.

*CQI-NPDCCH-NB* information element

-- ASN1START

CQI-NPDCCH-NB-r14 ::= ENUMERATED {

noMeasurements, candidateRep-A, candidateRep-B, candidateRep-C,

candidateRep-D, candidateRep-E, candidateRep-F, candidateRep-G,

candidateRep-H, candidateRep-I, candidateRep-J, candidateRep-K,

candidateRep-L}

-- ASN1STOP

#### – *CQI-NPDCCH-Short-NB*

The IE *CQI-NPDCCH-Short-NB* represents the short version of the downlink channel quality measurement of the NB-IoT carrier where the random access response is received. The codepoints for the CQI-NPDCCH-Short measurements are according to the mapping table in TS 36.133 [16]. The value *noMeasurements* indicates no measurement reporting.

*CQI-NPDCCH-Short-NB* information element

-- ASN1START

CQI-NPDCCH-Short-NB-r14 ::= ENUMERATED {

noMeasurements, candidateRep-1, candidateRep-2, candidateRep-3}

-- ASN1STOP

#### – *MeasResultServCell-NB*

The IE *MeasResultServCell-NB* covers the measured results for the serving cell.

*MeasResultServCell-NB* information element

-- ASN1START

MeasResultServCell-NB-r14 ::= SEQUENCE {

nrsrpResult-r14 NRSRP-Range-NB-r14,

nrsrqResult-r14 NRSRQ-Range-NB-r14

}

-- ASN1STOP

#### *– NRSRP-Range-NB*

The IE *NRSRP-Range-NB* specifies the value range used in NRSRP measurements and thresholds. Integer value for NRSRP measurements according to mapping table in TS 36.133 [16], Table 9.1.22.9-1.

***NRSRP-Range-NB* information element**

-- ASN1START

NRSRP-Range-NB-r14 ::= INTEGER(0..113)

-- ASN1STOP

#### *– NRSRQ-Range-NB*

The IE *NRSRQ-Range-NB* specifies the value range used in NRSRQ measurements and thresholds. Integer value for RSRQ measurements is according to mapping table in TS 36.133 [16], Table 9.1.22.14-1. The UE shall not report values 0 and 34.

***NRSRQ-Range-NB* information element**

-- ASN1START

NRSRQ-Range-NB-r14 ::= INTEGER(-30..46)

-- ASN1STOP

#### *– NSSS-RRM-Config-NB*

The IE *NSSS-RRM-Config-NB* provides the configuration for NSSS-based RRM measurements. See TS 36.133 [16], TS 36.211 [21] and TS 36.214 [48]. The UE only perfoms NSSS-based RRM measurement on cells for which the configuration has been provided.

*NSSS-RRM-Config-NB* information element

-- ASN1START

NSSS-RRM-Config-NB-r15 ::= SEQUENCE {

nsss-RRM-PowerOffset-r15 ENUMERATED {dB-3, db0, dB3},

nsss-NumOccDiffPrecoders-r15 ENUMERATED {n1, n2, n4, n8} OPTIONAL -- Need OP

}

-- ASN1STOP

| *NSSS-RRM-Config-NB* field descriptions |
| --- |
| ***nsss-RRM-PowerOffset***  NSSS to NRS ratio for the serving cell as specified in TS 36.214 [48]. Value in dB. Value dB-3 corresponds to -3 dB, dB0 corresponds to 0 dB and so on. |
| ***nsss-NumOccDiffPrecoders***  Number of consecutive NSSS occasions that use different precoders for NSSS transmission.See TS 36.211 [21]. Value *n1* corresponds to 1 occasion, *n2* corresponds to 2 occasions and so on.  For value *n2*, *n4*, and *n8*, UE may assume for *nsss-NumOccDiffPrecoders* consecutive NSSS occasions, E-UTRAN uses different precoders for NSSS transmission. For value *n1*, UE may assume that E-UTRAN always uses the same precoder.  If the field is absent, the UE makes no assumption on the antenna port(s) used for NSSS. |

#### 6.7.3.6 NB-IoT Other information elements

#### – *EstablishmentCause-NB*

The IE *EstablishmentCause-NB* provides the establishment cause for the RRC connection request or the RRC connection resume request as provided by the upper layers.

*EstablishmentCause-NB* informationelement

-- ASN1START

EstablishmentCause-NB-r13 ::= ENUMERATED {

mt-Access, mo-Signalling, mo-Data, mo-ExceptionData,

delayTolerantAccess-v1330, mt-EDT-v1610, spare2, spare1}

-- ASN1STOP

#### – *UE-Capability-NB*

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

*UE-Capability-NB* information element

-- ASN1START

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

accessStratumRelease-r13 AccessStratumRelease-NB-r13,

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

multipleDRB-r13 ENUMERATED {supported} OPTIONAL,

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

phyLayerParameters-r13 PhyLayerParameters-NB-r13,

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

dummy SEQUENCE {} OPTIONAL

}

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

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

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

phyLayerParameters-v1430 PhyLayerParameters-NB-v1430 OPTIONAL,

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

nonCriticalExtension UE-Capability-NB-v1440-IEs OPTIONAL

}

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

phyLayerParameters-v1440 PhyLayerParameters-NB-v1440 OPTIONAL,

nonCriticalExtension UE-Capability-NB-v14x0-IEs OPTIONAL

}

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

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

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension UE-Capability-NB-v1530-IEs OPTIONAL

}

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

earlyData-UP-r15 ENUMERATED {supported} OPTIONAL,

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

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

phyLayerParameters-v1530 PhyLayerParameters-NB-v1530 OPTIONAL,

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

nonCriticalExtension UE-Capability-NB-v15x0-IEs OPTIONAL

}

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

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

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension UE-Capability-NB-v1610-IEs OPTIONAL

}

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

earlySecurityReactivation-r16 ENUMERATED {supported} OPTIONAL,

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

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

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

phyLayerParameters-v1610 PhyLayerParameters-NB-v1610 OPTIONAL,

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

meas-Parameters-r16 Meas-Parameters-NB-r16,

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

nonCriticalExtension UE-Capability-NB-v16x0-IEs OPTIONAL

}

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

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

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension UE-Capability-NB-v1700-IEs OPTIONAL

}

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

connModeMeasIntraFreq-r17 ENUMERATED {supported} OPTIONAL,

connModeMeasInterFreq-r17 ENUMERATED {supported} OPTIONAL,

coverageBasedPaging-r17 ENUMERATED {supported} OPTIONAL,

phyLayerParameters-v1700 PhyLayerParameters-NB-v1700 OPTIONAL,

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

nonCriticalExtension SEQUENCE {} OPTIONAL

}

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

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

phyLayerParametersRel13-r15 PhyLayerParameters-NB-r13 OPTIONAL,

phyLayerParametersRel14-r15 PhyLayerParameters-NB-v1430 OPTIONAL,

phyLayerParameters-v1530 PhyLayerParameters-NB-v1530 OPTIONAL,

...

}

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

slotSymbolResourceResvDL-r16 ENUMERATED {supported} OPTIONAL,

slotSymbolResourceResvUL-r16 ENUMERATED {supported} OPTIONAL,

subframeResourceResvDL-r16 ENUMERATED {supported} OPTIONAL,

subframeResourceResvUL-r16 ENUMERATED {supported} OPTIONAL

}

AccessStratumRelease-NB-r13 ::= ENUMERATED {rel13, rel14, rel15, rel16, rel17, spare3, spare2, spare1, ...}

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

supportedROHC-Profiles-r13 SEQUENCE {

profile0x0002 BOOLEAN,

profile0x0003 BOOLEAN,

profile0x0004 BOOLEAN,

profile0x0006 BOOLEAN,

profile0x0102 BOOLEAN,

profile0x0103 BOOLEAN,

profile0x0104 BOOLEAN

},

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

...

}

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

rlc-UM-r15 ENUMERATED {supported} OPTIONAL

}

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

dataInactMon-r14 ENUMERATED {supported} OPTIONAL,

rai-Support-r14 ENUMERATED {supported} OPTIONAL

}

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

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

}

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

rai-SupportEnh-r16 ENUMERATED {supported} OPTIONAL

}

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

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

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

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

ntn-OffsetTimingEnh-r17 ENUMERATED {supported} OPTIONAL,

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

}

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

dl-ChannelQualityReporting-r16 ENUMERATED {supported} OPTIONAL

}

PhyLayerParameters-NB-r13 ::= SEQUENCE {

multiTone-r13 ENUMERATED {supported} OPTIONAL,

multiCarrier-r13 ENUMERATED {supported} OPTIONAL

}

PhyLayerParameters-NB-v1430 ::= SEQUENCE {

multiCarrier-NPRACH-r14 ENUMERATED {supported} OPTIONAL,

twoHARQ-Processes-r14 ENUMERATED {supported} OPTIONAL

}

PhyLayerParameters-NB-v1440 ::= SEQUENCE {

interferenceRandomisation-r14 ENUMERATED {supported} OPTIONAL

}

PhyLayerParameters-NB-v1530 ::= SEQUENCE {

mixedOperationMode-r15 ENUMERATED {supported} OPTIONAL,

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

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

nprach-Format2-r15 ENUMERATED {supported} OPTIONAL,

additionalTransmissionSIB1-r15 ENUMERATED {supported} OPTIONAL,

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

}

PhyLayerParameters-NB-v1610 ::= SEQUENCE {

npdsch-MultiTB-r16 ENUMERATED {supported} OPTIONAL,

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

npusch-MultiTB-r16 ENUMERATED {supported} OPTIONAL,

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

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

slotSymbolResourceResvDL-r16 ENUMERATED {supported} OPTIONAL,

slotSymbolResourceResvUL-r16 ENUMERATED {supported} OPTIONAL,

subframeResourceResvDL-r16 ENUMERATED {supported} OPTIONAL,

subframeResourceResvUL-r16 ENUMERATED {supported} OPTIONAL

}

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

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

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

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

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

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

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

}

PhyLayerParameters-NB-v1700 ::= SEQUENCE {

npdsch-16QAM-r17 ENUMERATED {supported} OPTIONAL,

npusch-16QAM-r17 ENUMERATED {supported} OPTIONAL

}

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

supportedBandList-r13 SupportedBandList-NB-r13,

multiNS-Pmax-r13 ENUMERATED {supported} OPTIONAL

}

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

powerClassNB-14dBm-r14 ENUMERATED {supported} OPTIONAL

}

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

SupportedBand-NB-r13 ::= SEQUENCE {

band-r13 FreqBandIndicator-NB-r13,

powerClassNB-20dBm-r13 ENUMERATED {supported} OPTIONAL

}

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

anr-Report-r16 ENUMERATED {supported} OPTIONAL,

rach-Report-r16 ENUMERATED {supported} OPTIONAL

}

-- ASN1STOP

| *UE-Capability-NB* field descriptions | *FDD/TDD appl* | *FDD/TDD diff* |
| --- | --- | --- |
| ***accessStratumRelease***  Set to rel17 in this version of the specification. | FDD/TDD | No |
| ***additionalTransmissionSIB1***  Indicates whether the UE supports additional SIB1 transmission as specified in TS 36.213 [23]. | FDD | - |
| ***anr-Report***  Indicates whether the UE supports ANR measurements in RRC\_IDLE. | FDD/TDD | No |
| ***connModeMeasIntraFreq, connModeMeasInterFreq***  Indicates whether the UE in RRC\_CONNECTED supports neighbour cell measurements. | FDD/TDD | No |
| ***coverageBasedPaging***  Indicates whether the UE in RRC\_IDLE supports coverage based paging carrier selection as defined in TS 36.304 [4]. | FDD/TDD | No |
| ***dataInactMon***  Indicates whether the UE supports the data inactivity monitoring as specified in TS 36.321 [6]. | FDD/TDD | No |
| ***dl-ChannelQualityReporting-r16***  Indicates whether the UE supports DL channel quality reporting in connected mode as specified in TS 36.321 [6]. | FDD | - |
| ***dummy***  This field is not used in the specification. It shall not be sent by the UE. | NA | NA |
| ***earlyData-UP, earlyData-UP-5GC***  Indicates whether the UE supports EDT for User plane CIoT EPS/5GS optimisations, as defined in TS 24.301 [35] and 24.501 [95] respectively. | FDD | - |
| ***earlySecurityReactivation***  Indicates whether the UE supports early security reactivation when resuming a suspended RRC connection. | FDD/TDD | No |
| ***interferenceRandomisation***  For FDD: Indicates whether the UE supports interference randomisation in connected mode as defined in TS.36.211 [21]. | FDD | - |
| ***maxNumberROHC-ContextSessions***  Set to the maximum number of concurrently active ROHC contexts supported by the UE, excluding context sessions that leave all headers uncompressed. cs2 corresponds with 2 (context sessions), cs4 corresponds with 4 and so on. The network ignores this field if the UE supports none of the ROHC profiles in *supportedROHC-Profiles*. | FDD/TDD | No |
| ***mixedOperationMode***  Defines whether the UE supports multi-carrier operation with mixed operation mode, standalone or inband/guardband, between the anchor carrier and the non-anchor carrier for unicast, paging, and random access as specified in TS 36.300 [9]. | FDD | - |
| ***multiCarrier***  Defines whether the UE supports multi -carrier operation. | FDD/TDD | Yes |
| ***multicarrier-NPRACH***  Defines whether the UE supports NPRACH on non-anchor carrier as specified in TS 36.321 [6]. | FDD/TDD | Yes |
| ***multipleDRB***  Defines whether the UE supports multiple DRBs. | FDD/TDD | No |
| ***multiNS-Pmax***  Defines whether the UE supports the mechanisms defined for NB-IoT cells broadcasting *NS-PmaxList-NB*. | FDD/TDD | No |
| ***multiTB-HARQ-AckBundling***  Indicates whether the UE supports HARQ ACK bundling for interleaved transmission for DL.  If *multiTB-HARQ-AckBundling* is included, the UE shall also indicate support for *npdsch-MultiTB-Interleaving*. | FDD | - |
| ***multiTone***  Defines whether the UE supports UL multi-tone transmissions on NPUSCH. | FDD/TDD | Yes |
| ***npdsch-16QAM***  Indicates whether the UE supports 16QAM for DL unicast as defined in TS 36.213 [23]. | TBD | TBD |
| ***npdsch-MultiTB***  Indicates whether the UE supports multiple TBs scheduling in RRC\_CONNECTED for DL.  If *npdsch-MultiTB* is included, the UE shall also indicate support for *twoHARQ-Processes*. | FDD | - |
| ***npdsch-MultiTB-Interleaving***  Indicates whether the UE supports interleaved transmission when multiple TBs is scheduled in RRC\_CONNECTED for DL. | FDD | - |
| ***nprach-Format2***  Defines whether the UE supports NPRACH resources using preamble format 2. | FDD | - |
| ***npusch-16QAM***  Indicates whether the UE supports 16QAM for UL unicast as defined in TS 36.213 [23]. | TBD | TBD |
| ***npusch-3dot75kHz-SCS-TDD***  Indicates whether the UE supports NPUSCH with 3.75kHz SCS for TDD. | TDD | - |
| ***npusch-MultiTB***  Indicates whether the UE supports multiple TBs scheduling in RRC\_CONNECTED for UL.  If *npusch-MultiTB* is included, the UE shall also indicate support for *twoHARQ-Processes*. | FDD | - |
| ***npusch-MultiTB-Interleaving***  Indicates whether the UE supports interleaved transmission when multiple TBs is scheduled in RRC\_CONNECTED for UL. | FDD | - |
| ***ntn-Connectivity-EPC***  Indicates whether the UE supports NTN access when connected to EPC. If the UE indicates this capability, the UE shall support all NTN essential features as specified in TS 36.306 [5]. | FDD | - |
| ***ntn-OffsetTimingEnh***  Indicates whether the UE supports timing relationship enhancement using *k-Off*set as specified in TS36.321 [6] and TS 36.213 [23]. | FDD | - |
| ***ntn-PUR-TimerDelay***  Indicates whether the UE supports delaying the start of the *pur-ResponseWindowTimer* for NTN, see TS 36.321 [6]. | FDD | - |
| ***ntn-ScenarioSupport***  Indicates whether the UE supports NTN features for GSO or NSGO scenario. | FDD | - |
| ***ntn-TA-report***  Indicates whether the UE supports time advance reporting in RRC\_CONNECTED, see TS 36.321 [6]. | FDD | - |
| ***powerClassNB-14dBm***  Defines whether the UE supports power class 14dBm in all the bands supported by the UE as specified in TS 36.101 [42].  If *powerClassNB-20dBm* is included, the UE shall not include the field *powerClassNB-14dBm*. | FDD/TDD | No |
| ***powerClassNB-20dBm***  Defines whether the UE supports power class 20dBm in NB-IoT for the band, as specified in TS 36.101 [42]. If neither *powerClassNB-14dBm* nor *powerClassNB-20dBm* is included, UE supports power class 23 dBm in the NB-IoT band. | FDD/TDD | No |
| ***pur-CP-EPC*, *pur-CP-5GC***  Indicates whether the UE supports transmission using PUR for Control plane CIoT EPS/5GS optimisations, as defined in TS 24.301 [35] and TS 24.501 [95] respectively. | FDD | - |
| ***pur-CP-L1Ack***  Indicates whether UE supports L1 acknowledgement in response to CP transmission using PUR.  If *pur-CP-L1Ack* is included, the UE shall also indicate support for *pur-CP-EPC* or *pur-CP-5GC*. | FDD | - |
| ***pur-NRSRP-Validation***  Indicates whether UE supports serving cell NRSRP for TA validation for transmission using PUR.  If *pur-NRSRP-Validation* is included, the UE shall also indicate support for *pur-CP-EPC*, *pur-CP-5GC*, *pur-UP-EPC* or *pur-CP-5GC*. | FDD | - |
| ***pur-UP-EPC*, *pur-UP-5GC***  Indicates whether the UE supports transmission using PUR for User plane CIoT EPS/5GS optimisations, as defined in TS 24.301 [35] and TS 24.501 [95] repectively. | FDD | - |
| ***rach-Report***  Indicates whether the UE supports delivery of *rach-Report*. | FDD/TDD | No |
| ***rai-Support***  Defines whether the UE supports release assistance indication (RAI) as specified in TS 36.321 [6]. | FDD/TDD | No |
| ***rai-SupportEnh***  Indicates whether the UE supports AS Release Assistance Indication via the DCQR and AS RAI MAC CE when connected to EPC as specified in TS 36.321 [6]. | FDD/TDD | No |
| ***rlc-UM***  Defines whether the UE supports RLC UM as specified in TS 36.322 [7]. | FDD/TDD | No |
| ***slotSymbolResourceResvDL***  Indicates whether the UE supports slot/symbol-level time-domain DL resource reservation, e.g. for NB-IoT coexistence with NR.  If *slotSymbolResourceResvDL* is included, the UE shall also indicate support for *subframeResourceResvDL*. | FDD/TDD | Yes |
| ***slotSymbolResourceResvUL***  Indicates whether the UE supports slot/symbol-level time-domain UL resource reservation, e.g. for NB-IoT coexistence with NR.  If *slotSymbolResourceResvUL* is included, the UE shall also indicate support for *subframeResourceResvUL*. | FDD/TDD | Yes |
| ***supportedBandList***  Includes the supported NB-IoT bands as defined in TS 36.101 [42]. | FDD/TDD | No |
| ***sr-SPS-BSR***  Defines whether the UE supports SR using SPS BSR as specified in TS 36.321 [6]. | FDD | - |
| ***sr-withHARQ-ACK***  Defines whether the UE supports physical layer SR with HARQ ACK as specified in TS 36.213 [23]. | FDD | - |
| ***sr-withoutHARQ-ACK***  Defines whether the UE supports physical layer SR without HARQ ACK as specified in TS 36.211 [21] and TS 36.213 [23]. | FDD | - |
| ***subframeResourceResvDL***  Indicates whether the UE supports subframe-level time-domain DL resource reservation, e.g. for NB-IoT coexistence with NR. | FDD/TDD | Yes |
| ***subframeResourceResvUL***  Indicates whether the UE supports subframe-level time-domain UL resource reservation, e.g. for NB-IoT coexistence with NR. | FDD/TDD | Yes |
| ***supportedROHC-Profiles***  List of supported ROHC profiles as defined in TS 36.323 [8]. | FDD/TDD | No |
| ***twoHARQ-Processes***  Defines whether the UE supports two HARQ processes operation in DL and UL as specified in TS 36.212 [22] and TS 36.213 [23]. | FDD/TDD | Yes |
| ***ue-Category-NB***  UE category as defined in TS 36.306 [5]. Value nb1 corresponds to UE category NB1, value nb2 corresponds to UE category NB2.  A UE shall always include the field *ue-Category-NB-r13* in this version of the specification. | FDD/TDD | Yes |

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

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

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

Editor's Note: RAN1 has sent an LS to RAN4 in R1-2202893 asking for their view on whether 16-QAM capability should be per-band.

#### – *UE-RadioPagingInfo-NB*

The IE *UE-RadioPagingInfo-NB* contains UE NB-IoT capability information needed for paging.

*UE-RadioPagingInfo-NB* information element

-- ASN1START

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

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

...,

[[ multiCarrierPaging-r14 ENUMERATED {true} OPTIONAL

]],

[[ mixedOperationMode-r15 ENUMERATED {supported} OPTIONAL,

wakeUpSignal-r15 ENUMERATED {true} OPTIONAL,

wakeUpSignalMinGap-eDRX-r15 ENUMERATED {ms40, ms240, ms1000, ms2000} OPTIONAL,

multiCarrierPagingTDD-r15 ENUMERATED {true} OPTIONAL

]],

[[ ue-Category-NB-r16 ENUMERATED {nb2} OPTIONAL,

groupWakeUpSignal-r16 ENUMERATED {true} OPTIONAL,

groupWakeUpSignalAlternation-r16 ENUMERATED {true} OPTIONAL

]]

}

-- ASN1STOP

| *UE-RadioPagingInfo-NB field descriptions* |
| --- |
| ***groupWakeUpSignal***  Indicates whether the UE in RRC\_IDLE supports GWUS without group resource alternation for paging in DRX in FDD as specified in TS 36.211 [21], TS 36.213 [23] and TS 36.304 [4]. If this field is included, the minimum gap between GWUS and associated PO for DRX is fixed as 40 ms. |
| ***groupWakeUpSignalAlternation***  Indicates whether the UE in RRC\_IDLE supports GWUS with group resource alternation for paging in DRX in FDD as specified in TS 36.211 [21], TS 36.213 [23] and TS 36.304 [4]. If this field is included, the minimum gap between GWUS and associated PO for DRX is fixed as 40 ms. |
| ***mixedOperationMode***  Indicates whether the UE supports multi-carrier operation with mixed operation mode, standalone or inband/guardband, between the anchor carrier and non-anchor carrier for unicast, paging, and random access, as specified in TS 36.300 [9]. |
| ***multiCarrierPaging***  Indicates whether the UE supports paging on non-anchor carriers as defined in TS 36.304 [4]. |
| ***multiCarrierPagingTDD***  Indicates whether the UE supports paging on non-anchor carriers for TDD as defined in TS 36.304 [4]. |
| ***ue-Category-NB***  UE NB-IoT category as defined in TS 36.306 [5]. Value *nb1* corresponds to UE category NB1, value *nb2* corresponds to UE category NB2.  A UE shall always include the field *ue-Category-NB-r13* in this version of the specification. |
| ***wakeUpSignal***  Indicates whether the UE supports WUS for paging in DRX in FDD as specified in TS 36.304 [4]. If this field is included, the minimum gap between WUS and associated PO for DRX is fixed as 40 ms. |
| ***wakeUpSignalMinGap-eDRX***  Indicates the minimum gap the UE supports between WUS or GWUS and associated PO in case of eDRX in FDD, as specified in TS 36.304 [4]. Value *ms40* corresponds to 40 ms, value *ms240* corresponds to 240 ms and so on.  If this field is included, the UE shall also indicate support for WUS or GWUS for paging in DRX. |

#### – *UE-TimersAndConstants-NB*

The IE *UE-TimersAndConstants-NB* contains timers and constants used by the UE in either RRC\_CONNECTED or RRC\_IDLE.

*UE-TimersAndConstants-NB* information element

-- ASN1START

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

t300-r13 ENUMERATED {

ms2500, ms4000, ms6000, ms10000,

ms15000, ms25000, ms40000, ms60000},

t301-r13 ENUMERATED {

ms2500, ms4000, ms6000, ms10000,

ms15000, ms25000, ms40000, ms60000},

t310-r13 ENUMERATED {

ms0, ms200, ms500, ms1000, ms2000, ms4000, ms8000},

n310-r13 ENUMERATED {

n1, n2, n3, n4, n6, n8, n10, n20},

t311-r13 ENUMERATED {

ms1000, ms3000, ms5000, ms10000, ms15000,

ms20000, ms30000},

n311-r13 ENUMERATED {

n1, n2, n3, n4, n5, n6, n8, n10},

...,

[[ t311-v1350 ENUMERATED {

ms40000, ms60000, ms90000, ms120000}

OPTIONAL -- Need OR

]],

[[ t300-v1530 ENUMERATED {

ms80000, ms100000, ms120000} OPTIONAL, -- Cond TDD

t301-v1530 ENUMERATED {

ms80000, ms100000, ms120000} OPTIONAL, -- Cond TDD

t311-v1530 ENUMERATED {

ms160000, ms200000} OPTIONAL, -- Cond TDD

t300-r15 ENUMERATED {ms6000, ms10000, ms15000, ms25000, ms40000,

ms60000, ms80000, ms120000} OPTIONAL -- Cond EDTorPUR

]]

}

-- ASN1STOP

| *UE-TimersAndConstants-NB* field descriptions |
| --- |
| ***n3xy***  Constants are described in clause 7.4. n1 corresponds with 1, n2 corresponds with 2 and so on. |
| ***t3xy***  Timers are described in clause 7.3. Value ms0 corresponds with 0 ms, ms200 corresponds with 200 ms and so on. The UE shall use the extended values *t311-v1350*, *t300-v1530, t301-v1530 and t311-v1530*, if present, and ignore the value signaled by *t311-r13, t300-r13, t301-r13* and *t311-r13* respectively.  *t300-r15* is only applicable for EDT or transmission using PUR with uplink data. UE performing EDT or transmission using PUR with uplink data shall use *t300-r15*, if present. |

| Conditional presence | Explanation |
| --- | --- |
| *EDTorPUR* | The field is optionally present, Need OR, if *edt-Parameters* or *cp-PUR-5GC* or *cp-PUR-EPC* or *up-PUR-5GC or up-PUR-EPC* is present in SIB2-NB; otherwise the field is not present and the UE shall delete any existing value for this field. |
| *TDD* | The field is optionally present, Need OR, in TDD mode. Otherwise, the field is not present. |

#### 6.7.3.7 NB-IoT MBMS information elements

Void

#### 6.7.3.7a NB-IoT SC-PTM information elements

#### – *SC-MTCH-InfoList-NB*

The IE *SC-MTCH-InfoList-NB* provides the list of ongoing MBMS sessions transmitted via SC-MRB and for each MBMS session, the associated G-RNTI and scheduling information.

*SC-MTCH-InfoList-NB* information element

-- ASN1START

SC-MTCH-InfoList-NB-r14 ::= SEQUENCE (SIZE (0.. maxSC-MTCH-NB-r14)) OF SC-MTCH-Info-NB-r14

SC-MTCH-Info-NB-r14 ::= SEQUENCE {

sc-mtch-CarrierConfig-r14 CHOICE {

dl-CarrierConfig-r14 DL-CarrierConfigCommon-NB-r14,

dl-CarrierIndex-r14 INTEGER (0.. maxNonAnchorCarriers-NB-r14)

},

mbmsSessionInfo-r14 MBMSSessionInfo-r13,

g-RNTI-r14 BIT STRING(SIZE(16)),

sc-mtch-SchedulingInfo-r14 SC-MTCH-SchedulingInfo-NB-r14 OPTIONAL, -- Need OP

sc-mtch-NeighbourCell-r14 BIT STRING (SIZE(maxNeighCell-SCPTM-NB-r14)) OPTIONAL, -- Need OP

npdcch-NPDSCH-MaxTBS-SC-MTCH-r14 ENUMERATED {n680, n2536},

npdcch-NumRepetitions-SC-MTCH-r14 ENUMERATED {r1, r2, r4, r8, r16,

r32, r64, r128, r256,

r512, r1024, r2048, spare4,

spare3, spare2, spare1},

npdcch-StartSF-SC-MTCH-r14 ENUMERATED {v1dot5, v2, v4, v8,

v16, v32, v48, v64},

npdcch-Offset-SC-MTCH-r14 ENUMERATED {zero, oneEighth, oneQuarter,

threeEighth, oneHalf, fiveEighth,

threeQuarter, sevenEighth},

...

}

SC-MTCH-SchedulingInfo-NB-r14 ::= SEQUENCE {

onDurationTimerSCPTM-r14 ENUMERATED {

pp1, pp2, pp3, pp4,

pp8, pp16, pp32, spare},

drx-InactivityTimerSCPTM-r14 ENUMERATED {

pp0, pp1, pp2, pp3,

pp4, pp8, pp16, pp32},

schedulingPeriodStartOffsetSCPTM-r14 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),

sf2048 INTEGER(0..2047),

sf4096 INTEGER(0..4095),

sf8192 INTEGER(0..8191)

},

...

}

-- ASN1STOP

| ***SC-MTCH-InfoList-NB* field descriptions** |
| --- |
| ***dl-CarrierConfig***  Downlink carrier used for SC-MTCH. E-UTRAN cannot configure a downlink carrier operating in mixed operation mode. |
| ***dl-CarrierIndex***  Index to a downlink carrier signalled in system information. Value '0' corresponds to the anchor carrier, value '1' corresponds to the first entry in *dl-ConfigList* in *SystemInformationBlockType22-NB,* value'2' corresponds to the second entry in *dl-ConfigList* and so on. |
| ***drx-InactivityTimerSCPTM***  Timer for SC-MTCH reception in TS 36.321 [6]. Value in number of NPDCCH periods. Value pp1 corresponds to 1 NPDCCH period, pp2 corresponds to 2 NPDCCH periods and so on. |
| ***g-RNTI***  G-RNTI used to scramble the scheduling and transmission of a SC-MTCH. |
| ***mbmsSessionInfo***  Indicates the ongoing MBMS session in a SC-MTCH. |
| ***npdcch-NPDSCH-MaxTBS-SC-MTCH***  Maximum NPDSCH TBS for the SC-MTCH, see TS 36.213 [23]. Value *n680* corresponds to 680 bits and value *n2536* corresponds to 2536 bits. |
| ***npdcch-NumRepetition-SC-MTCH***  The maximum number of NPDCCH repetitions the UE needs to monitor for SC-MTCH multicast search space, see TS 36.213 [23]. |
| ***npdcch-Offset-SC-MTCH***  Fractional period offset of starting subframe for NPDCCH multicast search space for SC-MTCH, see TS 36.213 [23]. |
| ***npdcch-startSF-SC-MTCH***  Starting subframes configuration of the NPDCCH multicast search space for SC-MTCH, see TS 36.213 [23]. |
| ***onDurationTimerSCPTM***  Timer for SC-MTCH reception in TS 36.321 [6]. Value in number of NPDCCH periods. Value pp1 corresponds to 1 NPDCCH period, pp2 corresponds to 2 NPDCCH periods and so on. |
| ***schedulingPeriodStartOffsetSCPTM***  *SCPTM-SchedulingCycle* and *SCPTM-SchedulingOffset* in TS 36.321 [6]. The value of *SCPTM-SchedulingCycle* is in number of sub-frames. Value sf10 corresponds to 10 sub-frames, sf20 corresponds to 20 sub-frames and so on. The value of *SCPTM-SchedulingOffset* is in number of sub-frames. |
| ***sc-mtch-CarrierConfig***  Downlink carrier that is used for SC-MTCH. |
| ***sc-mtch-NeighbourCell***  Indicates neighbour cells which also provide this service on SC-MTCH. The first bit is set to 1 if the service is provided on SC-MTCH in the first cell in *scptmNeighbourCellList*, otherwise it is set to 0. The second bit is set to 1 if the service is provided on SC-MTCH in the second cell in *scptmNeighbourCellList*, and so on. If this field is absent, the UE shall assume that this service is not available on SC-MTCH in any neighbour cell. |
| ***sc-mtch-SchedulingInfo***  DRX information for the SC-MTCH.  If this field is absent, DRX is not used for the SC-MTCH. |

#### – *SCPTM-NeighbourCellList-NB*

The IE *SCPTM-NeighbourCellList-NB* indicates a list of neighbour cells where ongoing MBMS sessions provided via SC-MRB in the current cells are also provided.

-- ASN1START

SCPTM-NeighbourCellList-NB-r14 ::= SEQUENCE (SIZE (1..maxNeighCell-SCPTM-NB-r14)) OF PCI-ARFCN-NB-r14

PCI-ARFCN-NB-r14 ::= SEQUENCE {

physCellId-r14 PhysCellId,

carrierFreq-r14 CarrierFreq-NB-r13 OPTIONAL -- Need OP

}

-- ASN1STOP

| *SCPTM-NeighbourCellList-NB field descriptions* |
| --- |
| ***physCellId***  Physical Cell Identity of the neighbour cell. |
| ***carrierFreq***  Carrier frequency of the neighbour cell.  Absence of the IE means that the neighbour cell is on the same frequency as the current cell. |

### 6.7.4 NB-IoT RRC multiplicity and type constraint values

### – Multiplicity and type constraint definitions

-- ASN1START

maxFreqANR-NB-r16 INTEGER ::= 2 -- Maximum number of NB-IOT carrier frequencies that can

-- be configured or reported for ANR measurement

maxFreqEUTRA-NB-r16 INTEGER ::= 8 -- Maximum number of EUTRAN carrier frequencies that can

-- be provided as assistance information for inter-RAT

-- cell selection

maxFreqsGERAN-NB-r16 INTEGER ::= 8 -- Maximum number of groups of GERAN carrier frequencies

-- that can be provided as assistance information for

-- inter-RAT cell selection

maxGWUS-Groups-1-NB-r16 INTEGER ::= 15 -- Maximum number of groups for each paging probability

-- group

maxGWUS-Resources-NB-r16 INTEGER ::= 2 -- Maximum number of GWUS resources for each gap

maxGWUS-ProbThresholds-NB-r16 INTEGER ::= 3 -- Maximum number of paging probability thresholds

maxNPRACH-Resources-NB-r13 INTEGER ::= 3 -- Maximum number of NPRACH resources for NB-IoT

maxNonAnchorCarriers-NB-r14 INTEGER ::= 15 -- Maximum number of non-anchor carriers for NB-IoT

maxDRB-NB-r13 INTEGER ::= 2 -- Maximum number of Data Radio Bearers for NB-IoT

maxNeighCell-SCPTM-NB-r14 INTEGER ::= 8 -- Maximum number of SCPTM neighbour cells

maxNS-Pmax-NB-r13 INTEGER ::= 4 -- Maximum number of NS and P-Max values per band

maxSC-MTCH-NB-r14 INTEGER ::= 64 -- Maximum number of SC-MTCHs in one cell for NB-IoT

maxSI-Message-NB-r13 INTEGER ::= 8 -- Maximum number of SI messages for NB-IoT

maxTAC-NB-r17 INTEGER ::= 12 -- Maximum number of Tracking Area Codes

-- broadcast in a cell

-- ASN1STOP

### – End of NBIOT-RRC-Definitions

-- ASN1START

END

-- ASN1STOP

### 6.7.5 Direct Indication Information

Direct Indication information is transmitted on NPDCCH using P-RNTI but without associated *Paging-NB* message. Table 6.7.5-1 defines the Direct Indication information, see TS 36.212 [22], clause 6.4.3.3.

When bit n is set to 1, the UE shall behave as if the corresponding field is set in the *Paging-NB* message, see 5.3.2.3. Bit 1 is the least significant bit.

Table 6.7.5-1: Direct Indication information

|  |  |
| --- | --- |
| **Bit** | Field in *Direct Indication information* |
| 1 | *systemInfoModification* |
| 2 | *systemInfoModification-eDRX* |
| 3, 4, 5, 6, 7, 8 | Not used, and shall be ignored by UE if received |