**3GPP TSG-RAN WG2 Meeting #121-bis-e *R2-230xxxx***

**Electronic, 17th – 26th Apr, 2023**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.306** | **CR** | **-** | **rev** | **-** | **Current version:** | **17.4.0** |  |
|  | | | | | | | | |
| *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:*** | UE capabilities for Rel-18 NCR | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Intel Corporation | | | | | | | | | |
| ***Source to TSG:*** | R2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_NetConRepeater | | | | |  | ***Date:*** | | | 2023-04-05 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-18 |
|  | *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)*  *Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Introduction of Rel-18 NCR related capabilities | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | 1. RAN2 #120 agreement on DRB and handover:  * NCR-MT indicates the maximum number of supported DRB in UE capability, values {1, 16}. If absent, the NCR-MT does not support DRB. * In Rel-18, NCR-MT does not support handover and RRM measurements in RRC\_CONNECTED.  1. RAN2 #121 agreement on RRC state:  * RRC\_INACTIVE is optionally supported without any specific enhancements.  1. Agreeable proposals in [Post121][702][NCR] Capabilities running CR for NCR | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Rel-18 NCR feature is not completed. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **x** |  | Other core specifications | | | | TS/TR 38.331 CR ... | | |
| ***affected:*** | |  | **x** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **x** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

1. ***Modified section***

## Abbreviations

For the purposes of the present document, the abbreviations given in TR 21.905 [1] 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].

A-CSI Aperiodic-CSI

BAP Backhaul Adaptation Protocol

BC Band Combination

BPS Body Proximity Sensing

BT Bluetooth

CCS Cross Carrier Scheduling

CMR Channel Measurement Resource

CPAC Conditional PSCell Addition/Change

DAPS Dual Active Protocol Stack

DL Downlink

EHC Ethernet Header Compression

FS Feature Set

FSPC Feature Set Per Component-carrier

GSO Geosynchronous Orbit

HSDN High Speed Dedicated Network

IAB-MT Integrated Access Backhaul Mobile Termination

MAC Medium Access Control

MHI Mobility History Information

MBS Multicast/Broadcast Service

MCG Master Cell Group

MN Master Node

MRB MBS Radio Bearer

MR-DC Multi-RAT Dual Connectivity

mTRP Multiple TRP

MUSIM Multi-Universal Subscriber Identity Module

NCR Network Controlled Repeater

NCR-MT NCR Mobile Termination

NCJT Non-Coherent Joint Transmission

NCSG Network Controlled Small Gap

NGSO Non-Geosynchronous Orbit

NTN Non-Terrestrial Network

P-CSI Periodic CSI

PDCP Packet Data Convergence Protocol

QoE Quality of Experience

RLC Radio Link Control

RTT Round Trip Time

SCG Secondary Cell Group

SDAP Service Data Adaptation Protocol

SN Secondary Node

sTRP Serving TRP

TRP Transmit/Receive Point

UDC Uplink Data Compression

UL Uplink

WLAN Wireless Local Area Network

***End of the modified section***

***2nd. Modified section***

### 4.2.2 General parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Definitions for parameters | Per | M | FDD-TDD DIFF | **FR1-FR2**  DIFF |
| ***accessStratumRelease***  Indicates the access stratum release the UE supports as specified in TS 38.331 [9]. | UE | Yes | No | No |
| ***delayBudgetReporting***  Indicates whether the UE supports delay budget reporting as specified in TS 38.331 [9]. | UE | No | No | No |
| ***dl-DedicatedMessageSegmentation-r16***  Indicates whether the UE supports reception of segmented DL RRC messages. | UE | No | No | No |
| ***drx-Preference-r16***  Indicates whether the UE supports providing its preference of a cell group on DRX parameters for power saving in RRC\_CONNECTED, as specified in TS 38.331 [9]. | UE | No | No | No |
| ***gNB-SideRTT-BasedPDC-r17***  Indicates whether the UE supports gNB-side RTT-based PDC, as specified in TS 38.300 [28]. A UE supporting this feature shall also support *rtt-BasedPDC-CSI-RS-ForTracking-r17* and/or *rtt-BasedPDC-PRS-r17*. | UE | No | No | No |
| ***inactiveState***  Indicates whether the UE supports RRC\_INACTIVE as specified in TS 38.331 [9]. This capability is not applicable to NCR-MT. | UE | Yes | No | No |
| ***inactiveStateNTN-r17***  Indicates whether the UE supports RRC\_INACTIVE in NTN as specified in TS 38.331 [9]. It is mandated if the UE indicates the support of *nonTerrestrialNetwork-r17*. | UE | CY | No | No | |
| ***inactiveStatePO-Determination-r17***  Indicates whether the UE supports to use the same i\_s to determine PO in RRC\_INACTIVE state as in RRC\_IDLE state. | UE | No | No | No |
| ***inDeviceCoexInd-r16***  Indicates whether the UE supports IDC (In-Device Coexistence) assistance information as specified in TS 38.331 [9]. | UE | No | No | No |
| ***maxBW-Preference-r16, maxBW-Preference-r17***  Indicates whether the UE supports providing its preference of a cell group on the maximum aggregated bandwidth for power saving in RRC\_CONNECTED, as specified in TS 38.331 [9]. | UE | No | No | Yes  (Incl FR2-2 DIFF) |
| ***maxCC-Preference-r16***  Indicates whether the UE supports providing its preference of a cell group on the maximum number of secondary component carriers for power saving in RRC\_CONNECTED, as specified in TS 38.331 [9]. | UE | No | No | No |
| ***maxMIMO-LayerPreference-r16, maxMIMO-LayerPreference-r17***  Indicates whether the UE supports providing its preference of a cell group on the maximum number of MIMO layers for power saving in RRC\_CONNECTED, as specified in TS 38.331 [9]. | UE | No | No | Yes  (Incl FR2-2 DIFF) |
| ***maxMRB-Add-r17***  Indicates the additional maximum number of MRBs that the UE supports for MBS multicast reception as specified in TS 38.331 [9]. | UE | No | No | No |
| ***mcgRLF-RecoveryViaSCG-r16***  Indicates whether the UE supports recovery from MCG RLF via split SRB1 (if supported) and via SRB3 (if supported) as specified in TS 38.331[9]. | UE | No | No | No |
| ***minSchedulingOffsetPreference-r16***  Indicates whether the UE supports providing its preference on the minimum scheduling offset for cross-slot scheduling of the cell group for power saving in RRC\_CONNECTED, as specified in TS 38.331 [9]. | UE | No | No | No |
| ***mpsPriorityIndication-r16***  Indicates whether the UE supports *mpsPriorityIndication* on RRC release with redirect as defined in TS 38.331 [9]. | UE | No | No | No |
| ***musim-GapPreference-r17***  Indicates whether the UE supports providing MUSIM assistance information with MUSIM gap preference and related MUSIM gap configuration, as defined in TS 38.331 [9]. UE supporting this feature supports 3 periodic gaps and 1 aperiodic gap. | UE | No | No | No |
| ***musimLeaveConnected-r17***  Indicates whether the UE supports providing MUSIM assistance information with indication of leaving RRC\_CONNECTED state as defined in TS 38.331 [9]. | UE | No | No | No |

***End of the modified section***

***3rd . Modified section***

### 4.2.X NCR Parameters

#### 4.2.X.1 Mandatory NCR-MT features

Table 4.2.x.1-x captures feature groups, which are mandatory for an NCR-MT.

CA, MR-DC, handover (e.g. CHO, DAPS, CPAC, etc) related UE features and corresponding capabilities are not supported by an NCR-MT. All other feature groups or components of the feature groups as captured in TR 38.822 [24] as well as capabilities specified in this specification are optional for an NCR-MT, unless indicated otherwise.Table 4.2.xx.1-x: Layer-2 and Layer-3 mandatory features for NCR-MT

| Features | Index | Feature group | Components | Additional information |
| --- | --- | --- | --- | --- |
| 0. General | 0-0 | NCR procedures | 1) Side control information over MAC CE and RRC, as specified in TS 38.321 [8] and TS 38.331 [9], respectively.  2) Switching OFF NCR-Fwd during radio link failure in TS 38.331 [9], beam failure recovery in TS 38.321 [8], and cell reselection in TS 38.304 [21]. |  |
| 1. PDCP | 1-0 | Basic PDCP procedures | 1) (de)Ciphering on SRB 2) Integrity protection on SRB 4) Re-ordering and in-order delivery 6) Duplicate discarding  7) 12bits SN |  |
| 2. RLC | 2-0 | Basic RLC procedures | 1) RLC TM  2) RLC AM with 12bits SN |  |
|  | 2-4 | NR RLC SN size for SRB | NR RLC SN size for SRB |  |
| 3. MAC | 3-0 | Basic MAC procedures | 1) RA procedure on PCell 2) NCR-MT initiated RA procedure (including for beam recovery purpose) 3) NW initiated RA procedure (i.e. based on PDCCH) 4) Support of ssb-Threshold and association between preamble/PRACH occasion and SSB 5) Preamble grouping 6) UL single TA maintenance 7) HARQ operation for DL and UL 8) LCH prioritization 9) Prioritized bit rate 10) Multiplexing 11) SR with single SR configuration 12) BSR 13) PHR 14) 8bits and 16bits L field |  |
| 9. RRC | 9-1 | RRC buffer size | Maximum overall RRC configuration size | 45 Kbytes |
|  | 9-2 | RRC processing time | 1) RRC connection establishment 3) RRC connection reconfiguration without SCell addition/release and SCG establishment/modification/release 4) RRC connection re-establishment.  5) RRC connection reconfiguration with sync procedure 8) Initial security activation 10) UE capability transfer | 1) to 3) 10ms 4) 10ms  5): 10ms + additional delay (cell search time and synchronization) defined in TS 38.133 8) 5ms 10) 80ms |

#### 4.2.X.2 General Parameters

| Definitions for parameters | Per | M | FDD-TDD  DIFF | FR1-FR2  DIFF |
| --- | --- | --- | --- | --- |
| ***inactiveStateNCR-r18***  Indicates whether the NCR-MT supports RRC\_INACTIVE as specified in TS 38.331 [9]. | NCR-MT | No | No | No |
| ***supportedNumberOfDRBs-NCR-r18***  Indicates the number of DRB that NCR-MT supports. If absent, NCR-MT does not support DRB. If absent, NCR-MT also does not support SDU discard in PDCP and RLC, and counter check in RRC. | NCR-MT | No | No | No |
| ***nonDRB-NCR-r18***  Indicates whether the NCR-MT supports SRB2 configuration without a DRB, as specified in TS 38.331 [9]. | NCR-MT | No | No | No |

#### 4.2.X.3 SDAP Parameters

| Definitions for parameters | Per | M | FDD-TDD  DIFF | FR1-FR2  DIFF |
| --- | --- | --- | --- | --- |
| ***sdap-QOS-NCR-r18***  Indicates whether the NCR-MT supports flow-based QoS and multiple flows to 1 DRB mapping, as specified in TS 37.324 [25]. | NCR-MT | No | No | No |
| ***sdap-HeaderNCR-r18***  Indicates whether the NCR-MT supports UL SDAP header and SDAP End-marker, as specified in TS 37.324 [25]. | NCR-MT | No | No | No |

#### 4.2.X.4 PDCP Parameters

| Definitions for parameters | Per | M | FDD-TDD  DIFF | FR1-FR2  DIFF |
| --- | --- | --- | --- | --- |
| ***longSN-NCR-r18***  Indicates whether the NCR-MT supports 18 bit length of PDCP sequence number. | NCR-MT | No | No | No |

#### 4.2.X.5 RLC Parameters

| Definitions for parameters | Per | M | FDD-TDD  DIFF | FR1-FR2  DIFF |
| --- | --- | --- | --- | --- |
| ***am-WithLongSN-NCR-r18***  Indicates whether the NCR-MT supports AM DRB with 18 bit length of RLC sequence number. | NCR-MT | No | No | No |

***End of the modified section***