**3GPP TSG-RAN WG2 #127bis *R2-24xxxxx***

**Hefei, China, 14-18 October 2024**

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

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| ***Title:*** | Mandatory support of Enhanced channel raster by RedCap UE | | | | | | | | | |
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| ***Source to WG:*** | Ericsson | | | | | | | | | |
| ***Source to TSG:*** | R2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_redcap-Core | | | | |  | ***Date:*** | | | 2024-10-16 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***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-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
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| ***Reason for change:*** | | In “LS on mandated support of the enhanced channel raster by RedCap UEs from Rel-17” ([R2-2407826](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_127/Docs//R2-2407826.zip)), RAN4 “…consider support of the enhanced raster by RedCap UEs essential and should therefore be mandated for all RedCap UEs from Rel-17, eRedCap UEs from Rel-18”. | | | | | | | | |
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| ***Summary of change:*** | | 1. Added that enhancedChannelRaster-r18 indicates whether the (e)RedCap UE supports Enhanced channrel raster. 2. Added that RedCap UE supports (mandatory with capability signalling) the channel raster as specified in TS 38.101-1 [2], clause 5.4I, for all bands supported by the UE. 3. Added that eRedCap UE supports (mandatory with capability signalling) the channel raster as specified in TS 38.101-1 [2], clause 5.4I, for all bands supported by the UE.   **Impact Analysis**  Impacted 5G architecture options: NR SA  Impacted functionality: RedCap UE RF  Inter-operability:  1. If the network is implemented according to the CR and the UE is not, the network operator will need to make compromises on capacity (e.g. PDCCH), performance and spectrum utilization, if at all possible, to configure a RedCap BWP (see [R4-2411670](http://www.3gpp.org/ftp//tsg_ran/WG4_Radio/TSGR4_112/Docs//R4-2411670.zip)).  2. If the UE is implemented according to the CR and the network is not, there are no interoperability issues. | | | | | | | | |
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| ***Consequences if not approved:*** | | Some RedCap UE implementations compliant with Rel-17 may not support a configuration and location of a UE-specific channel bandwidth off the 100 kHz channel raster in bands with this raster granularity.  For RedCap UEs it must always be possible to configure BWPs and associated UE-specific channel bandwidths smaller than the gNB channel bandwidth. | | | | | | | | |
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| ***Clauses affected:*** | | 4.2.7.2, 4.2.21.1, 4.2.22.1 | | | | | | | | |
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|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

#### 4.2.7.2 *BandNR parameters*

| ***Definitions for parameters*** | Per | M | FDD-TDD  DIFF | FR1-FR2  DIFF |
| --- | --- | --- | --- | --- |
| ***enhancedChannelRaster-r18***  Indicates whether the UE supports the requirements for UE channel bandwidths located on the enhanced channel raster of a band as specified in TS 38.101-1 [2] and TS 38.101-5 [34]. It is mandatory with capability signalling for all Rel-18 UEs for certain bands as defined in TS 38.101-1 [2] and TS 38.101-5 [34]. Otherwise, it is optional.  Indicates whether the (e)RedCap UE supports the requirements for UE channel bandwidths located on the enhanced channel raster of a band as specified in TS 38.101-1 [2], clause 5.4I, for all bands supported by the UE. It is mandatory with capability signalling for all (e)RedCap UEs. | Band | CY | N/A | FR1 only |

#### 4.2.21.1 Definition of RedCap UE

RedCap UE is the UE with reduced capability:

- The maximum bandwidth is 20 MHz for FR1, and is 100 MHz for FR2. UE features and corresponding capabilities related to UE bandwidths wider than 20 MHz in FR1 or wider than 100 MHz in FR2 are not supported by RedCap UEs;

- The mandatory support (with capability signalling, enhancedChannelRaster-r18) of the channel raster as specified in TS 38.101-1 [2], clause 5.4I, for all bands supported by the UE;

- The maximum mandatory supported DRB number is 8;

- The mandatory supported PDCP SN length is 12 bits while 18 bits being optional;

- The mandatory supported RLC AM SN length is 12 bits while 18 bits being optional;

- For FR1, 1 DL MIMO layer if 1 Rx branch is supported, and 2 DL MIMO layers if 2 Rx branches are supported; for FR2, either 1 or 2 DL MIMO layers can be supported, while 2 Rx branches are always supported. For FR1 and FR2, UE features and corresponding capabilities related to more than 2 UE Rx branches or more than 2 DL MIMO layers, as well as UE features and capabilities related to more than 1 UE Tx branch or more than 1 UL MIMO layer are not supported by RedCap UEs;

- CA, MR-DC, DAPS, CPAC, IAB (i.e., the RedCap UE is not expected to act as IAB node), and NCR (i.e., the RedCap UE is not expected to act as NCR-MT) related UE features and corresponding capabilities are not supported by RedCap UEs. 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 remain applicable for RedCap UEs same as other UEs, unless indicated otherwise.

#### 4.2.22.1 Definition of eRedCap UE

eRedCap UE is the UE with reduced peak data rate and, with or without reduced baseband bandwidth in FR1:

- The maximum bandwidth is 20 MHz for FR1. UE features and corresponding capabilities related to UE bandwidths wider than 20 MHz in FR1 are not supported by eRedCap UEs. eRedCap UEs do not support operation in FR2 and in FR1 60kHz SCS.

- The mandatory support (with capability signalling, enhancedChannelRaster-r18) of the channel raster as specified in TS 38.101-1 [2], clause 5.4I, for all bands supported by the UE;

- CA, MR-DC, DAPS, CPAC, IAB (i.e., the eRedCap UE is not expected to act as IAB node), and NCR (i.e., the eRedCap UE is not expected to act as NCR-MT) related UE features and corresponding capabilities are not supported by eRedCap UEs. 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 remain applicable for eRedCap UEs same as other UEs, unless indicated otherwise.