**3GPP TSG-RAN WG2 Meeting #131 *<TDoc#>***

**Bengaluru, India, 25th-29th August, 2025**

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| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
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|  | **38.331** | **CR** | **xxxx** | **rev** | **-** | **Current version:** | **18.6.0** |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network | **X** | Core Network |  |

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| ***Title:***  | Introduction of band specific capability for paging [Per\_Band\_Paging\_Cap] |
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| ***Source to WG:*** | Huawei, Nokia, Xiaomi, Ericsson |
| ***Source to TSG:*** | R2 |
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| ***Work item code:*** | TEI19 |  | ***Date:*** | 2025-08-15 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | Rel-19 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe 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:*** | The *UERadioPagingInformation* can be used by gNB to determine whether to page one specific UE based on its capability information. For example, if the gNB already bars 2Rx XR UEs, while the *UERadioPagingInformation* indicates the paging is for 2Rx XR UE, the gNB can consider to not send the AS paging message at all, since there will be no such kind of UE camped on the cell.However, if some paging related capability is per band capability, the gNB needs more accurate information from *UERadioPagingInformation* about paged UE. For the same example, gNB may already bar for the cell for 2Rx XR UE. In such case, UE supporting 2Rx on the bands of this cell will be barred. Therefore, gNB can assume there will be no UE camped on the cell, which supports 2Rx XR on those bands. The precise information contained in the *UERadioPagingInformation* should inform the gNB about the bands on which the paged UE supports 2Rx XR.This issue is common for any legacy features, which is band related capability and follows the feature specific cell barring check, including (e)RedCap UE, 2Rx XR UE, NES UE. For the (e)RedCap UE Rx branches, which is FSPC capability, the network implementation can determine the (e)RedCap UE Rx per band capability based on *maxNumberMIMO-LayersPDSCH*.RAN2 made following agreements based on the related discussion.* We will address the issue of band specific capability. No UE behaviour impact.
* Agree the R19 TEI: add per band UE paging capability information in UERadioPagingInformation for the legacy features, which is band related capability and follows the feature specific cell barring check (including (e)RedCap UE, 2Rx XR UE, NES UE).

Therefore, new signalings are added in the *UERadioPagingInformation*. |
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| ***Summary of change:*** | 1. Add list of *FreqBandIndicatorNR* for each feature to indicate the band(s) on which the UE supports this feature. Those features, as RAN2 agreed, are categorized as 1Rx RedCap, 2Rx RedCap, 1Rx eRedCap, 2Rx eRedCap, 2Rx XR, NES.2. In the field descriptions, clarify that:* For the (e)RedCap UE Rx branches, the network implementation can determine the (e)RedCap UE Rx per band capability based on *maxNumberMIMO-LayersPDSCH*, which is similar description as legacy text “which are derived by the gNB from *UE-NR-Capability”.*
* If the new R19 per band signaling is included, the legacy R17/R18 per UE signaling for (e)RedCap cases may be ignored by a receiving gNB. For example, to avoid the collision between numberOfRxRedCap-r17 and oneRxRedCapPerBand-r19, since the R17 field may indicate UE as 1RX on UE level (any band) while R19 field only specifically indicates UE as 1Rx on some particular bands.

**Impact Analysis**Impacted 5G Architecture options:NR SA, (NG)EN-DC, NE-DC, NR-DCImpacted functionality:PagingInter-operability:1. If the network supports the changes and the UE does not, there is no inter-operability issue.2. If the UE supports the changes and the network does not, there is no inter-operability issue. |
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| ***Consequences if not approved:*** | gNB may not know whether the paged UE supports the specific feature on the used band(s). |
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| ***Clauses affected:*** | 11.2.2 |
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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 ...  |
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| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

Start of Change

#### – *UERadioPagingInformation*

This message is used to transfer radio paging information, covering both upload to and download from the 5GC, and between gNBs.

Direction: gNB to/ from 5GC and gNB to/from gNB

*UERadioPagingInformation* message

-- ASN1START

-- TAG-UE-RADIO-PAGING-INFORMATION-START

UERadioPagingInformation ::= SEQUENCE {

 criticalExtensions CHOICE {

 c1 CHOICE{

 ueRadioPagingInformation UERadioPagingInformation-IEs,

 spare7 NULL,

 spare6 NULL, spare5 NULL, spare4 NULL,

 spare3 NULL, spare2 NULL, spare1 NULL

 },

 criticalExtensionsFuture SEQUENCE {}

 }

}

UERadioPagingInformation-IEs ::= SEQUENCE {

 supportedBandListNRForPaging SEQUENCE (SIZE (1..maxBands)) OF FreqBandIndicatorNR OPTIONAL,

 nonCriticalExtension UERadioPagingInformation-v15e0-IEs OPTIONAL

}

UERadioPagingInformation-v15e0-IEs ::= SEQUENCE {

 dl-SchedulingOffset-PDSCH-TypeA-FDD-FR1 ENUMERATED {supported} OPTIONAL,

 dl-SchedulingOffset-PDSCH-TypeA-TDD-FR1 ENUMERATED {supported} OPTIONAL,

 dl-SchedulingOffset-PDSCH-TypeA-TDD-FR2 ENUMERATED {supported} OPTIONAL,

 dl-SchedulingOffset-PDSCH-TypeB-FDD-FR1 ENUMERATED {supported} OPTIONAL,

 dl-SchedulingOffset-PDSCH-TypeB-TDD-FR1 ENUMERATED {supported} OPTIONAL,

 dl-SchedulingOffset-PDSCH-TypeB-TDD-FR2 ENUMERATED {supported} OPTIONAL,

 nonCriticalExtension UERadioPagingInformation-v1700-IEs OPTIONAL

}

UERadioPagingInformation-v1700-IEs ::= SEQUENCE {

 ue-RadioPagingInfo-r17 OCTET STRING (CONTAINING UE-RadioPagingInfo-r17) OPTIONAL,

 inactiveStatePO-Determination-r17 ENUMERATED {supported} OPTIONAL,

 numberOfRxRedCap-r17 ENUMERATED {one, two} OPTIONAL,

 halfDuplexFDD-TypeA-RedCap-r17 SEQUENCE (SIZE (1..maxBands)) OF FreqBandIndicatorNR OPTIONAL,

 nonCriticalExtension UERadioPagingInformation-v1800-IEs OPTIONAL

}

UERadioPagingInformation-v1800-IEs ::= SEQUENCE {

 numberOfRxERedCap-r18 ENUMERATED {one, two} OPTIONAL,

 supportOf2RxXR-r18 ENUMERATED {supported} OPTIONAL,

 nonCriticalExtension UERadioPagingInformation-v1840-IEs OPTIONAL

}

UERadioPagingInformation-v1840-IEs ::= SEQUENCE {

 dl-SchedulingOffset-PDSCH-TypeA-FDD-FR2-NTN-r18 ENUMERATED {supported} OPTIONAL,

 dl-SchedulingOffset-PDSCH-TypeB-FDD-FR2-NTN-r18 ENUMERATED {supported} OPTIONAL,

 nonCriticalExtension UERadioPagingInformation-v19xy-IEs OPTIONAL

}

UERadioPagingInformation-v19xy-IEs ::= SEQUENCE {

oneRxRedCapPerBand-r19 SEQUENCE (SIZE (1..maxBands)) OF FreqBandIndicatorNR OPTIONAL,

twoRxRedCapPerBand-r19 SEQUENCE (SIZE (1..maxBands)) OF FreqBandIndicatorNR OPTIONAL,

oneRxE-RedCapPerBand-r19 SEQUENCE (SIZE (1..maxBands)) OF FreqBandIndicatorNR OPTIONAL,

twoRxE-RedCapPerBand-r19 SEQUENCE (SIZE (1..maxBands)) OF FreqBandIndicatorNR OPTIONAL,

twoRxXR-PerBand-r19 SEQUENCE (SIZE (1..maxBands)) OF FreqBandIndicatorNR OPTIONAL,

nesCellDTX-DRX-PerBand-r19 SEQUENCE (SIZE (1..maxBands)) OF FreqBandIndicatorNR OPTIONAL,

 nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- TAG-UE-RADIO-PAGING-INFORMATION-STOP

-- ASN1STOP

| *UERadioPagingInformation* field descriptions |
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| ***supportedBandListNRForPaging***Indicates the UE supported NR frequency bands which are derived by the gNB from *UE-NR-Capability*. |
| ***dl-SchedulingOffset-PDSCH-TypeA-FDD-FR1***Indicates whether the UE supports DL scheduling slot offset (K0) greater than 0 for PDSCH mapping type A in FDD FR1. |
| ***dl-SchedulingOffset-PDSCH-TypeA-FDD-FR2-NTN***Indicates whether the UE supports DL scheduling slot offset (K0) greater than 0 for PDSCH mapping type A in FDD FR2-NTN. |
| ***dl-SchedulingOffset-PDSCH-TypeA-TDD-FR1***Indicates whether the UE supports DL scheduling slot offset (K0) greater than 0 for PDSCH mapping type A in TDD FR1. |
| ***dl-SchedulingOffset-PDSCH-TypeA-TDD-FR2***Indicates whether the UE supports DL scheduling slot offset (K0) greater than 0 for PDSCH mapping type A in TDD FR2. |
| ***dl-SchedulingOffset-PDSCH-TypeB-FDD-FR1***Indicates whether the UE supports DL scheduling slot offset (K0) greater than 0 for PDSCH mapping type B in FDD FR1. |
| ***dl-SchedulingOffset-PDSCH-TypeB-FDD-FR2-NTN***Indicates whether the UE supports DL scheduling slot offset (K0) greater than 0 for PDSCH mapping type B in FDD FR2-NTN. |
| ***dl-SchedulingOffset-PDSCH-TypeB-TDD-FR1***Indicates whether the UE supports DL scheduling slot offset (K0) greater than 0 for PDSCH mapping type B in TDD FR1. |
| ***dl-SchedulingOffset-PDSCH-TypeB-TDD-FR2***Indicates whether the UE supports DL scheduling slot offset (K0) greater than 0 for PDSCH mapping type B in TDD FR2. |
| ***halfDuplexFDD-TypeA-RedCap***Indicates whether the (e)RedCap UE only supports half-duplex operation for FDD in the indicated band(s). |
| ***inactiveStatePO-Determination***Indicates whether the UE supports to use the same i\_s to determine PO in RRC\_INACTIVE state as in RRC\_IDLE state. |
| ***numberOfRxERedCap***Indicates the number of Rx branches supported by an eRedCap UE. |
| ***numberOfRxRedCap***Indicates the number of Rx branches supported by a RedCap UE. |
| ***nesCellDTX-DRX-PerBand***Indicates whether the UE supports *nes-CellDTX-DRX* in the indicated band(s). |
| ***oneRxE-RedCapPerBand***Indicates whether the eRedCap UE supports 1Rx branch in the indicated band(s) which is derived by the gNB from *maxNumberMIMO-LayersPDSCH* from *UE-NR-Capability*. If this field is included, the *numberOfRxERedCap-r18* may be ignored by a receiving gNB. |
| ***oneRxRedCapPerBand***Indicates whether the RedCap UE supports 1Rx branch in the indicated band(s) which is derived by the gNB from *maxNumberMIMO-LayersPDSCH* from *UE-NR-Capability*. If this field is included, the *numberOfRxRedCap-r17* may be ignored by a receiving gNB. |
| ***supportOf2RxXR***Indicates whether the UE is a 2Rx XR UE. |
| ***twoRxE-RedCapPerBand***Indicates whether the eRedCap UE supports 2Rx branches in the indicated band(s) which is derived by the gNB from *maxNumberMIMO-LayersPDSCH* from *UE-NR-Capability*. If this field is included, the *numberOfRxERedCap-r18* may be ignored by a receiving gNB. |
| ***twoRxRedCapPerBand***Indicates whether the RedCap UE supports 2Rx branches in the indicated band(s) which is derived by the gNB from *maxNumberMIMO-LayersPDSCH* from *UE-NR-Capability*. If this field is included, the *numberOfRxRedCap-r17* may be ignored by a receiving gNB. |
| ***twoRxXR-PerBand***Indicates whether the UE supports 2Rx XR in the indicated band(s). If this field is included, the *supportOf2RxXR-r18* may be ignored by a receiving gNB. |
| ***ue-RadioPagingInfo***The field is used to transfer UE capability information used for paging. The gNB generates the ue-RadioPagingInfo and the contained UE capability information is absent when not supported by the UE. |

End of Change