**3GPP TSG-RAN WG2 Meeting #109 electronic dradft\_R2-2002118**

24th Feb – 6th Mar 2020

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **36.304** | **CR** | **0784** | **rev** | **-** | **Current version:** | **15.5.0** |  |
|  | | | | | | | | |
| *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:*** | Correction of TS 36.304 to introduce IAB | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, HiSilicon | | | | | | | | | |
| ***Source to TSG:*** | R2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_IAB Core | | | | |  | ***Date:*** | | | 2020-02-24 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-16 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) Rel-12 (Release 12)* *Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | RAN2 agreed to introduce the IAB supporting indication in the SIB1 to indicate whether cell is a candidate cell for IAB node. Both support of IAB node(s) and the cell status for IAB node(s) is combined in the IE *iab-Support,* i.e. if the IE is present, the cell supports IABs and the cell is also considered as a candidate for IABs; if the IE is absent, the cell does not support IAB and/or the cell is barred for IAB.  In the TS 36.304, the deterimination of cell status for IAB cell should be clarified using the new defined IE in RRC. | | | | | | | | |
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| ***Summary of change:*** | | In section 5.3.1:  Add “iab-Support” to determine the cell status;  **Impact analysis**  Impacted 5G architecture options: EN-DC  Impacted functionality:  Cell status  Inter-operability:   1. If the UE is implemented according to this CR but the network is not, there is no inter-operability issue foreseen. 2. If the network is implemented according to this CR but the UE is not, there is no inter-operability issue foreseen. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | IAB node can not determine whether the cell supporting IAB and whether the cell is barred for IAB node. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 3.3, 5.3.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |

--------------------- [Start of 1st change] ---------------------------------

## 3.3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

1xRTT CDMA2000 1x Radio Transmission Technology

AS Access Stratum

AC Access Class (of the USIM)

ACDC Application specific Congestion control for Data Communication

BCCH Broadcast Control Channel

BL Bandwidth reduced Low complexity

BR-BCCH Bandwidth Reduced Broadcast Control Channel

BSS Basic Service Set

CMAS Commercial Mobile Altert System

CSG Closed Subscriber Group

DRX Discontinuous Reception

DL-SCH Downlink Shared Channel

EHPLMN Equivalent Home PLMN

EPC Evolved Packet Core

EPS Evolved Packet System

ETWS Earthquake and Tsunami Warning System

E-UTRA Evolved UMTS Terrestrial Radio Access

E-UTRAN Evolved UMTS Terrestrial Radio Access Network

FDD Frequency Division Duplex

GERAN GSM/EDGE Radio Access Network

HPLMN Home PLMN

HSDN High Speed Dedicated Network

H-SFN Hyper System Frame Number

HRPD High Rate Packet Data

IAB Integrated Access and Backhaul

IMSI International Mobile Subscriber Identity

MBMS Multimedia Broadcast-Multicast Service

MBSFN Multimedia Broadcast multicast service Single Frequency Network

MCC Mobile Country Code

MCCH Multicast Control Channel

MDT Minimization of Drive Tests

MM Mobility Management

MNC Mobile Network Code

MPDCCH MTC Physical Downlink Control Channel

MTCH Multicast Traffic Channel

NAS Non-Access Stratum

NB-IoT NarrowBand Internet of Things

NR NR Radio Access

PLMN Public Land Mobile Network

ProSe Proximity-based Services

PSM Power Saving Mode

PTW Paging Time Window

PWS Public Warning System

RAT Radio Access Technology

RNA RAN-based Notification Area

RNAU RAN-based Notification Area Update

RRC Radio Resource Control

SAP Service Access Point

SIBX SystemInformationBlockTypeX

TDD Time Division Duplex

UAC Unified Access Control

UE User Equipment

UMTS Universal Mobile Telecommunications System

USIM Universal Subscriber Identity Module

UTRA UMTS Terrestrial Radio Access

UTRAN UMTS Terrestrial Radio Access Network

V2X Vehicle-to-Everything

WUS Wake Up Signal

--------------------- [End of 1st change] ---------------------------------

--------------------- [Start of 2nd change] ---------------------------------

## 5.3 Cell Reservations and Access Restrictions

There are two mechanisms which allow an operator to impose cell reservations or access restrictions. The first mechanism uses indication of cell status and special reservations for control of cell selection and reselection procedures. The second mechanism, referred to as Access Control, shall allow preventing selected classes of users or ACDC categories from sending initial access messages for load control reasons. For Access Control based on Access Classes, at subscription, one or more Access Classes are allocated to the subscriber and stored in the USIM TS 22.011 [4]. For Access Control based on ACDC categories, at subscription at least four ACDC categories are allocated to the subscriber and stored in the ACDC MO TS 24.105 [31] or USIM TS 31.102 [32].

### 5.3.1 Cell status and cell reservations

Cell status and cell reservations are indicated in the *SystemInformationBlockType1* message (or *SystemInformationBlockType1-BR* message or *SystemInformationBlockType1-NB* message) TS 36.331 [3] by means of the following fields:

- *cellBarred* (IE type: "barred" or "not barred")   
This field indicates if the cell is barred for connectivity to EPC.  
This field is ignored by the UEs supporting *crs-IntfMitig* while *crs-IntfMitigEnabled* is included in SIB1.   
This field is ignored by the BL UEs or UEs in CE supporting *ce-CRS-IntfMitig* while *crs-IntfMigitNumPRBs* is included in SIB1-BR.  
In case of multiple EPC PLMNs indicated in SIB1/SIB1-BR, this field is common for all EPC PLMNs

NOTE: For IAB node, it ignores the *cellBarred*, *cellReservedForOperatorUse* and *cellReservedForOtherUse* as defined in TS 36.331 [3].

Editor Notes: This can be updated based on the possible agreements by discussion of “R2-2002058, Summary of 6.1.5.3: SI Broadcast, cell Restrictions/Reservation and Barring, Initial Access, and Connection Setup, Ericsson”.

- *cellBarred-5GC* (IE type: "barred" or "not barred")  
This field indicates if the cell is barred for connectivity to 5GC.  
This field is ignored if the UE does not support E-UTRA connected to 5GC or if the UE supports network-based CRS interference mitigation and *nw-BasedCRS-InterferenceMitigation* is included in *SystemInformationBlockType1*.  
In case of multiple 5GC PLMNs indicated in SIB1, this field is common for all 5GC PLMNs.

- *cellReservedForOperatorUse* (IE type: "reserved" or "not reserved")  
This field indicates if the cell is reserved for operator use.  
This field is ignored by the UEs supporting *crs-IntfMitig* while *crs-IntfMitigEnabled* is included in SIB1.   
This field is ignored by the BL UEs or UEs in CE supporting *ce-CRS-IntfMitig* while *crs-IntfMigitNumPRBs* is included in SIB1-BR.   
In case of multiple EPC or 5GC PLMNs indicated in SIB1/SIB1-BR, this field is specified per EPC or 5GC PLMN.

- *cellBarred-CRS* (IE type: "barred" or "not barred")  
This field indicates if the cell is barred for connectivity to EPC for UEs supporting network-based CRS interference mitigation.  
*barred* means the cell is barred for UEs supporting *crs-IntfMitig* while *crs-IntfMitigEnabled* is included in SIB1. For BL UEs or UEs in CE capable of *ce-CRS-IntfMitig*, *barred* means the cell is barred while *crs-IntfMitigNumPRBs* is included in SIB1-BR.  
This field is ignored by the UE if the UE does not support CRS interference mitigation or while *crs-IntfMitigConfig* is not included in SIB1 (SIB1-BR for BL UEs or UEs in CE).  
In case of multiple PLMNs indicated in SIB1/SIB1-BR, this field is common for all PLMNs.

- *cellBarred-5GC-CRS* (IE type: "barred" or "not barred")  
This field indicates if the cell is barred for connectivity to 5GC for UEs supporting network-based CRS interference mitigation.  
This field is ignored if the UE does not support E-UTRA connected to 5GC or network-based CRS interference mitigation.  
In case of multiple 5GC PLMNs indicated in SIB1, this field is common for all 5GC PLMNs.

- *cellReservedForOperatorUse-CRS* (IE type: "reserved" or "not reserved")  
This field indicates if the cell is reserved for operator use for UEs supporting network-based CRS interference mitigation.  
*reserved* means the cell is "reserved" for operator use for UEs supporting *crs-IntfMitig* while *crs-IntfMitigEnabled* is included in SIB1.   
For BL UEs or UEs in CE capable of *ce-CRS-IntfMitig*, *reserved* means the cell is "reserved" for operator use while *crs-IntfMitigNumPRBs* is included in SIB1-BR.  
This field is ignored if the UE does not support CRS interference mitigation or while *crs-IntfMitigConfig* is not included in SIB1 (SIB1-BR for BL UEs or UEs in CE).  
In case of multiple PLMNs indicated in SIB1/SIB1-BR, this field is specified per PLMN.

- *iab-Support* (IE type: "true")

Indicated in *SIB1* message. In case of multiple PLMNs indicated in *SIB1*, this field is specified per PLMN. [This field indicates if the cell is barred for IAB node or the cell does not support IAB node, or both. When this field is absent, the IAB node shall treat this cell as if cell status is barred]

Editor Notes: The need of the text in bracket is FFS.

The following description for handling of barred and reserved cells is per CN type. If the UE supports more than one CN type, the UE shall only exclude a cell as candidate for selection/reselection if it is excluded for both CN types.

NOTE: Fields *cellBarred-CRS* and *cellReservedForOperatorUse-CRS* are not indicated in *SystemInformationBlockType1-NB*

When cell status is indicated as "not barred" and "not reserved" for operator use,

- All UEs shall treat this cell as candidate during the cell selection and cell reselection procedures.

When cell status is indicated as "not barred" and "reserved" for operator use for any PLMN,

- UEs assigned to Access Class 11 or 15 operating in their HPLMN/EHPLMN shall treat this cell as candidate during the cell selection and reselection procedures if the field *cellReservedForOperatorUse* for that PLMN set to "reserved".

- UEs assigned to an Access Class in the range of 0 to 9, 12 to 14 shall behave as if the cell status is "barred" in case the cell is "reserved for operator use" for the registered PLMN or the selected PLMN.

NOTE: ACs 11, 15 are only valid for use in the HPLMN/ EHPLMN; ACs 12, 13, 14 are only valid for use in the home country TS 22.011 [4].

When cell status "barred" is indicated or to be treated as if the cell status is "barred",

- The UE is not permitted to select/reselect this cell, not even for emergency calls.

- The UE shall consider other cells for cell selection/reselection according to the following rule:

- If the cell is to be treated as if the cell status is "barred" due to being unable to acquire the *MasterInformationBlock (*or *MasterInformationBlock-NB),* the *SystemInformationBlockType1 (*or *SystemInformationBlockType1-BR* message or *SystemInformationBlockType1-NB),* or the *SystemInformationBlockType2 (*or *SystemInformationBlockType2-NB)*:

- the UE may exclude the barred cell as a candidate for cell selection/reselection for up to 300 seconds.

- the UE may select another cell on the same frequency if the selection criteria are fulfilled.

- the UE may select the same cell in normal coverage if the UE was barred in the cell due to being unable to acquire *MasterInformationBlock*, *SystemInformationBlockType1-BR*, or *SystemInformationBlockType2* in enhanced coverage, but was able to acquire *MasterInformationBlock*, *SystemInformationBlockType1*, and *SystemInformationBlockType2* in normal coverage, if the selection criteria are fulfilled.

- else

- If the cell is a CSG cell:

- the UE may select another cell on the same frequency if the selection/reselection criteria are fulfilled.

- If operating as an IAB-MT and the cell is to be treated as if the cell status is "barred" due to *iab-Support* being absentin *SIB1*:

- The IAB-MT may exclude the barred cell as a candidate for cell selection/reselection for up to 300 seconds;

Editor Notes: FFS on the need of above text.

- else

- If the field *intraFreqReselection* in field *cellAccessRelatedInfo* in *SystemInformationBlockType1 (*or *SystemInformationBlockType1-BR* message or *SystemInformationBlockType1-NB)* message is set to "allowed", the UE may select another cell on the same frequency if re-selection criteria are fulfilled.

- The UE shall exclude the barred cell as a candidate for cell selection/reselection for 300 seconds.

- If the field *intraFreqReselection* in field *cellAccessRelatedInfo* in *SystemInformationBlockType1* (or *SystemInformationBlockType1-BR* message or *SystemInformationBlockType1-NB*) message is set to "not allowed" the UE shall not re-select a cell on the same frequency as the barred cell;

- The UE shall exclude the barred cell and the cells on the same frequency as a candidate for cell selection/reselection for 300 seconds.

The cell selection of another cell may also include a change of RAT or, if the previous and selected cell are both E-UTRA cells, a change of the CN type.

--------------------------[End of change] ------------------------------