**3GPP TSG-RAN WG2 Meeting #109Bis-e R2-2002691**

**E-meeting, April 2020**

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| *CR-Form-v11.4* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **38.321** | **CR** | **0708** | **rev** | **-** | **Current version:** | **16.0.0** |  |
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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 | **X** | Radio Access Network | **X** | Core Network |  |

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| ***Title:*** | IAB MAC – rapporteur corrections and clarifications | | | | | | | | | |
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| ***Source to WG:*** | Samsung | | | | | | | | | |
| ***Source to TSG:*** | R2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_IAB | | | | |  | ***Date:*** | | | 2020-04-09 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***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)* | |
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| ***Reason for change:*** | | This CR deals with what are perceived to be non-controversial (albeit critical) corrections, based on agreements already made as part of the IAB WI. | | | | | | | | |
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| ***Summary of change:*** | | * Clarification to existing text on Guard symbols for IAB, to avoid misinterpretation * Correction to table Table 5.20-1 (and alignment with RAN1 terminology) * Several editorial clarifications | | | | | | | | |
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| ***Consequences if not approved:*** | | Incorrect interpretation of the procedure for handling the Guard Symbols MAC CE(s). Lack of consistency across the spec. | | | | | | | | |
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| ***Clauses affected:*** | | 5.20 Guard symbols for IAB  6.1.3.1 Buffer Status Report MAC CEs | | | | | | | | |
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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:*** | |  | | | | | | | | |

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| ***This CR's revision history:*** |  |

FIRST CHANGE

5.20 Guard symbols for IAB

For IAB operation, the MAC entity on the IAB-DU or IAB-donor DU should reserve a sufficient number of symbols at the beginning and/or the end of slots where the child IAB-node switches operation from its IAB-DU to its IAB-MT function and operation from its IAB-MT function to its IAB-DU. The MAC entity on the IAB-DU or IAB-donor DU informs the child node about the number of guard symbols it provides via the Provided Guard Symbol MAC CE. The IAB-MT on the child node can inform the parent IAB-DU or IAB-donor DU about the number of guard symbols desired via the Desired Guard Symbol MAC CE.

Upon reception of a Provided Guard Symbol MAC CE the MAC entity shall:

- indicate to lower layers the number of provided guard symbols and the SCS configuration.

The MAC entity may:

1> if a Desired Guard Symbol query has not been triggered:

2> trigger a Desired Guard Symbol query.

If the MAC entity has UL resources allocated for new transmission the MAC entity shall:

1> for each Desired Guard Symbol query that has been triggered and not cancelled:

2> if the allocated UL resources can accommodate a Desired Guard Symbol MAC CE plus its subheader as a result of LCP as defined in clause 5.4.3.1:

3> instruct the Multiplexing and Assembly procedure to generate the Desired Guard Symbol MAC CE;

3> cancel this Desired Guard Symbol query.

A separate value for the number of guard symbols is specified for each of the following eight switching scenarios (see Table 5.20-1).

**Table 5.20-1: Switching scenarios and relevant guard symbols**

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| **Switching scenario** | | **Field for number of guard symbols in MAC CE** |
| IAB-MT operation to IAB-DU operation | MT Rx to DU Tx | NmbGS1 |
| MT Rx to DU Rx | NmbGS2 |
| MT Tx to DU Tx | NmbGS3 |
| MT Tx to DU Rx | NmbGS4 |
| IAB-DU operation to IAB-MT operation | DU Rx to MT Tx | NmbGS5 |
| DU Rx to MT Rx | NmbGS6 |
| DU Tx to MT Tx | NmbGS7 |
| DU Tx to MT Rx | NmbGS8 |

NEXT CHANGE

6.1.3.1 Buffer Status Report MAC CEs

Buffer Status Report (BSR) MAC CEs consist of either:

- Short BSR format (fixed size); or

- Long BSR format (variable size); or

- Short Truncated BSR format (fixed size); or

- Long Truncated BSR format (variable size); or

- Pre-emptive BSR format (variable size).

The BSR formats are identified by MAC subheaders with LCIDs as specified in Table 6.2.1-2.

The fields in the BSR MAC CE are defined as follows:

- LCG ID: The Logical Channel Group ID field identifies the group of logical channel(s) whose buffer status is being reported. The length of the field is 3 bits;

- LCGi: For the Long BSR format, this field indicates the presence of the Buffer Size field for the logical channel group i. The LCGi field set to 1 indicates that the Buffer Size field for the logical channel group i is reported. The LCGi field set to 0 indicates that the Buffer Size field for the logical channel group i is not reported. For the Long Truncated BSR format, this field indicates whether logical channel group i has data available. The LCGi field set to 1 indicates that logical channel group i has data available. The LCGi field set to 0 indicates that logical channel group i does not have data available;

- Buffer Size: The Buffer Size field identifies the total amount of data available according to the data volume calculation procedure in TSs 38.322 [3] and 38.323 [4] across all logical channels of a logical channel group after the MAC PDU has been built (i.e. after the logical channel prioritization procedure, which may result the value of the Buffer Size field to zero). The amount of data is indicated in number of bytes. The size of the RLC and MAC headers are not considered in the buffer size computation. The length of this field for the Short BSR format and the Short Truncated BSR format is 5 bits. The length of this field for the Long BSR format and the Long Truncated BSR format is 8 bits. The values for the 5-bit and 8-bit Buffer Size fields are shown in Tables 6.1.3.1-1 and 6.1.3.1-2, respectively. For the Long BSR format and the Long Truncated BSR format, the Buffer Size fields are included in ascending order based on the LCGi. For the Long Truncated BSR format the number of Buffer Size fields included is maximised, while not exceeding the number of padding bits. For the Pre-emptive BSR format, the Buffer Size field identifies the total amount of the data expected to arrive at the IAB-MT of the node where the Pre-emptive BSR is triggered and does not include the volume of data currently available in the IAB-MT. Pre-emptive BSR format is identical to the Long BSR format.

NOTE 1: For the Pre-emptive BSR, if configured, the LCGs to be reported, the expected data volume calculation, the exact time to report Pre-emptive BSR and the associated LCH are left to implementation.

NOTE 2: The mapping of LCGs between the ingress and egress links of an IAB node for purposes of determining expected change in occupancy of IAB-MT buffers (to be reported as Pre-emptive BSR) is left to implementation.

NOTE 3: The number of the Buffer Size fields in the Long BSR and Long Truncated BSR format can be zero.

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**Figure 6.1.3.1-1: Short BSR and Short Truncated BSR MAC CE**

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**Figure 6.1.3.1-2: Long BSR, Long Truncated BSR, and Pre-emptive BSR** **MAC CE**