**3GPP TSG-RAN WG2 Meeting #127 *R2-240xxxx***

**Maastricht, Netherlands, August 19th – 23rd 2024**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
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|  | **38.321** | **CR** | **1901** | **rev** | **-** | **Current version:** | **17.9.0** |  |
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| *For* ***[HE](http://www.3gpp.org/3G_Specs/CRs.htm%22%20%5Cl%20%22_blank)******[LP](http://www.3gpp.org/3G_Specs/CRs.htm%22%20%5Cl%20%22_blank)*** *on using this form: comprehensive instructions can be found at <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 on use of recommended of IAB-MT beam indication. |
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| ***Source to WG:*** | Ericsson |
| ***Source to TSG:*** | R2 |
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| ***Work item code:*** | NR\_IAB\_enh-Core |  | ***Date:*** | 2024-08-09 |
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| ***Category:*** | **F** |  | ***Release:*** | Rel-17 |
|  | *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-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
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| ***Reason for change:*** | RAN1 agreed on indication of restricted and recommended beams for IAB-nodes.Following agreements were made regarding the usage:**Agreement (RAN1#105)**In case of simultaneous MT/DU operation, * **the parent node can dynamically indicate to the child node at least a set of restricted beams at the IAB-DU of the child node**
* **the child node can dynamically report to the parent node a set of recommended beams**, not preferred beams, or both recommended and not preferred beams of the IAB-MT of the child node
	+ FFS: Whether the specification supports all reporting combinations.
* FFS: Applicability to specific multiplexing cases or specific time-frequency resources
* FFS: Additional semi-static signaling
* FFS: Per-panel granularity in addition to per-beam granularity
* FFS: Relationship between child IAB-MT beam indication and parent IAB-DU beam indication
* Note: This does not preclude any enhancements for either DU or MT-based CLI measurement and reports

**Agreement (RAN1#106)**The child node **indication of recommended beams** to the parent node can **include** both **IAB-MT DL** beams and/or **IAB-MT UL** beams.* FFS: Indication via MAC-CE or UCI transmission
* FFS: Definition of IAB-MT DL beams and/or IAB-MT UL beams (e.g. TCI state ID, Spatial relation information ID, RS ID (including CSI-RS, SRS, SSB, etc.))
* FFS: Whether indication of “not preferred” beams is supported

**Agreement (RAN1#106)**MAC-CE signaling from a parent node is supported for **indication of beams of an IAB-DU** in the direction of which simultaneous **operation is restricted*** FFS: Details of beam indication (e.g. TCI state ID, Spatial relation information ID, RS ID (including CSI-RS, SRS, SSB, etc.))
* FFS: Applicability to other beams

It is our understanding that* Restricted beams are by the parent IAB-node to indicate a restricted use of IAB-DU beams.
* Recommended beams are by the IAB-node to indicate what IAB-MT beams are preferred/recommended (for transmissions on the parent backhaul link).
* Recommended beam indications are not related to or bound to an indication of a restricted beam. A recommended IAB-MT beam can be indicated without any need for an indication of an IAB-DU beam restriction.
* A recommended IAB-MT beam does not recommend on the use (or non-use, i.e., restriction) of IAB-DU beams.

Opposite to above agreements, Rel-17 TS38.321 states that “IAB-MT Recommended Beam Indication MAC CE is used by an IAB-node to indicate to its parent node **recommendations for such a restriction**” |
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| ***Summary of change:*** | In section**5.18.26 Restricted and recommended beam indication for IAB**Child IAB-DU Restricted Beam Indication MAC CE is used by an IAB-node to indicate to its child node spatial resources and associated frequency information where simultaneous transmission/reception from the IAB-MT and transmission from the IAB-DU cells is restricted. IAB-MT Recommended Beam Indication MAC CE is used by an IAB-node to indicate to its parent node recommendations ~~for such a restriction~~ for IAB-MT beams to be used for its UL or for DL transmissions. Time resources where these restrictions/recommendations can apply are indicated via RRC, while the MAC CE further selects from these time resources the specific time resource configuration (comprising a list of slot indices) to which information provided in the MAC CE applies.**Impact Analysis** **Impacted 5G architecture options**: NR SA, (NG)EN-DC, NE-DC,NR-DC **Impacted functionality**: Measurements **Inter-operability**: 1. If the network is implemented according to the CR and the UE is not, the IAB-node and its parent node may be misasligned in the interpretation about which beam to use. 2. If the UE is implemented according to the CR and the network is not, there is no inter-operability issue |
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| ***Consequences if not approved:*** | If the CR is not approved, the use of recommended IAB-MT beam indications is wrongly described and leads to ambiguous interpretation at IAB-node and its parent node. |
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| ***Clauses affected:*** | 5.18.26 |
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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:*** |  |

*START OF CHANGES*

### 5.18.26 Restricted and recommended beam indication for IAB

Child IAB-DU Restricted Beam Indication MAC CE is used by an IAB-node to indicate to its child node spatial resources and associated frequency information where simultaneous transmission/reception from the IAB-MT and transmission from the IAB-DU cells is restricted. IAB-MT Recommended Beam Indication MAC CE is used by an IAB-node to indicate to its parent node recommendations for IAB-MT beams to be used for the UL or DL transmissions of the IAB-MT. Time resources where these restrictions/recommendations can apply are indicated via RRC, while the MAC CE further selects from these time resources the specific time resource configuration (comprising a list of slot indices) to which information provided in the MAC CE applies.

Upon reception of a Child IAB-DU Restricted Beam Indication MAC CE the IAB-node shall:

- apply the configuration signalled in the MAC CE to the time slots indicated in *IAB-ResourceConfig* (as specified in TS 38.331 [5]) which contains *iab-ResourceConfigID* parameter which matches the Resource Configuration ID field of the MAC CE.

The MAC entity may:

1> if an IAB-MT Recommended Beam Indication query has not been triggered:

2> trigger an IAB-MT Recommended Beam Indication query for this Serving Cell.

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

1> for each IAB-MT Recommended Beam Indication query that has been triggered and not cancelled:

2> if the allocated UL resources can accommodate a IAB-MT Recommended Beam Indication 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 IAB-MT Recommended Beam Indication MAC CE;

3> cancel this IAB-MT Recommended Beam Indication query.

*ND OF CHANGES*