3GPP TSG-RAN WG2 Meeting #110 electronic R2-200xxxx

Online, June 1 – June 12 2020

Agenda Item: 6.1.7

Source: Huawei, HiSilicon

**Title:** Summary of offline discussion [AT110e][049][IAB] Other

Document for: Discussion and Decision

# Introduction

This paper aims at capturing the summary of the following offline discussion:

* [AT110e][049][IAB] Other (Huawei)

Scope: Treat papers under 6.1.7, identify agreeable items, make agreements as far as possible.

Part 1: Agreements

Part 2: Agreed CRs 304, 322, (RRC impacts should be captured in the main IAB RRC CR).

Deadline: EOM

# Discussion

**Issue 1: NPN related issue**

As discussed in R2-2004876 and R2-2005406, followings are observed:

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| Observation 1: A NPN capable IAB MT, which ignores *cellReservedForOtherUse*, will incorrectly use the first PLMN ID which is invalid for SIB validity check when camping on NPN-only cell.  Observation 2: A NPN capable IAB MT, which ignores *cellReservedForOtherUse*, will incorrectly calculate the index of the “selectedPLMN-Identity” including in RRCSetupComplete/RRCResumeComplete message when camping on NPN-only cell. |

With the above issues identified, the NPN capable IAB-MT should use *cellReservedForOtherUse* to determine the NPN-only cell, rather than totally ignore it.

It is straight forward to have the following proposal, if R2 will agree the CRs to support NPN in IAB.

**Potential Proposal 1: *cellReservedForOtherUse* is ignored by IAB-MT, except for determination of an NPN-only cell for the NPN capable IAB-MT.**

**Question 1: Do you agree with the above proposal and its impact to 38.331 and 38.304?**

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| **Companies** | **Agree or not?** | **Comments** |
| Ericsson | Agree | IEs should be ignored for the determination of the cell status and cell reservations i.e. for the determination of a cell considered barred. It should not be ignored for the determination of an NPN cell. |
| Kyocera | Agree, but… | We think the wording “ignore” has a bit broad meaning and the intention of agreement was that the IAB-MT treats the cell as “not barred” even if *cellReservedForOtherUse* is set to “true”. So, we’re wondering whether the exception is added as in Potential Proposal 1 or rather the text is reworded to align with the intention. |
| CATT | Agree | As our contribution mentioned, a NPN capable IAB MT, which ignores cellReservedForOtherUse, will cause incorrect behaviors when camping on NPN-only cell. Thus we support the Potential Proposal 1.  Regarding to the spec impact, we think it’s better to clarify this issue in both 38.331 and 38.304 to avoid the confusion. We provide the related TPs in R2-2004876 and R2-2005406. |
| ZTE | Agree | Since the IE cellReservedForOtherUse is used by NPN-capable UE to determines that a cell is NPN-only Cell, it should not be ignored by the NPN capable IAB-MT. |
| vivo | Agree | We understand the concern from Kyocera w.r.t. “ignore”, it leads to some confusion. So in this case, maybe some re-wording would be beneficial. |
| Huawei | Agree | Some wording updates can be discussed in the CR review, e.g. “IAB-MT does not consider *cellReservedForOtherUse* for cell barring determination.“ |
| LG | Agree, but | The IE should be ignored when determination of cell reservation status, but the UE should be still used to identify if the cell is NPN-only cell or not. |
| Samsung | Agree | Agree the proposal but the current proposal seems self-conflict since IAB-MT includes NPN capable IAB-MT. Please find our suggestion on P1. |

**Summary: All companies agree with the intention from the P1, but we may need some wording updated. Following proposal is given, and the exact wording can be discussed during CR review phase.**

**Proposal 1: *cellReservedForOtherUse* is ignored by non-NPN capable IAB-MT for cell barring determination, but still considered by NPN capable IAB-MT for determination of an NPN-only cell.**

**Question 2: Is there any other spec impact for IAB-MT supporting NPN, other than above proposal and endorsed changes in R2-2004280/R2-2004281?**

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| **Companies** | **Comments** |
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**Issue 2: cell barring related issues**

**2.1 Ignore *cellReservedForFutureUse***

As proposed in R2-2004876 and R2-2004783, it seems straight forward for IAB-MT to ignore *cellReservedForFutureUse*, and just check its specific *iab-Spport* for cell barring.

**Potential Proposal 2: IAB-MTs ignore the *cellReservedForFutureUse***

**Question 3: Do you agree with the above proposal?**

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| **Companies** | **Agree or not?** | **Comments** |
| Ericsson | Agree |  |
| Kyocera | Agree, but… | We think it’s straight forward to ignore *cellReservedForFutureUse* as same with *cellReservedForOtherUse*, since the IAB-node is considered as a network node. However, we’re wondering if the word “ignore” is too broad as we commented in Question 1. |
| CATT | Agree | Since *cellReservedForFutureUse* is newly added by NPN WI for future use, with the same principle that the access control of IAB node is controlled by IE *iab-Support* independently, *cellReservedForFutureUse* should also be ignored by IAB node. |
| ZTE | Agree | We think the IAB-MTs should ignore the IE. |
| vivo | Agree | Agree |
| Huawei | Agree |  |
| LG | Agree |  |
| Samsung | Agree |  |

**Summary: All companies agree with the intention from the P2.**

**Proposal 2: IAB-MTs ignore the *cellReservedForFutureUse***

**2.2 intraFreqReselection for IAB-MT**

We have agreed in last meeting that “IAB-MT ignores *intraFreqReselection*” and also in the endorsed CR as “IAB-MT ignores *intraFreqReselection* (i.e. treats *intraFreqReselection* as if it was set to *allowed*)”. In this meeting, new option is proposed in R2-2004783 as option 2.

**Option 1: Keep the current agreement and running CR: IAB-MT ignores *intraFreqReselection* as if it was set to *allowed.***

**Option 2: Introduce new IE *intraFreqReselection*-IAB for IAB-MT specific network control of *intraFreqReselection*.**

**Question 4: Which option do you prefer on *intraFreqReselection* for IAB-MT?**

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| **Companies** | **Option 1 or 2?** | **Comments** |
| Ericsson | Option 1 |  |
| Kyocera | Option 1 and 2 | We think Option 2 is still on top of Option 1. In the email discussion “[AT109bis-e][024] 3X.304 CRs and IAB supporting in NPN”, 6 out of 10 companies raised the concerns to Option 1, whereby Option 2 can avoid the problem caused by reselecting an intra-frequency non-best cell. Also, we assume Option 2 may be implemented in SIB1 with optional IE (i.e., ENUMERATED {notAllowed} OPTIONAL), so it’s no harmful for the other 4 companies, since they can always choose not to broadcast *intraFreqReselection-IAB* in their deployments. |
| CATT | Option 1 | We think Option 1 is sufficient. We don’t see a strong motivation to introduce a new IE with the same function and setting as the old one for which we have agreed to ignore for IAB node. |
| ZTE | Option 1 | IAB-MT should follow the previous agreement to just ignore the *intraFreqReselection* IE. |
| Vivo | Option 1 |  |
| Huawei | Option 1 |  |
| LG | Option1 |  |
| Samsung | Option 1 |  |

**Summary: All companies are fine with Option 1.Therefore, no need of further agreement.**

**Issue 3: RLC spec correction on supporting BAP**

[R2-2005523](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_110-e\Docs\R2-2005523.zip) Correction on RLC spec to support the BAP as upper layer

As proposed in the above paper, in the current TS 38.322, the RLC PDU carries the Data field. In R15, only PDCP is the upper layer of the RLC, so “The maximum Data field size is the maximum size of a PDCP PDU”, which was true for access RLC. Since we have introduced BAP also as the upper layer of BH RLC in IAB, the RLC SDU could either be PDCP PDU or BAP PDU.

For now, we don’t have the limitation (or not define) the maximum size of BAP PDU. This should be clarified in the RLC spec that the current description “The maximum Data field size is the maximum size of a PDCP PDU” only applies to the case of access RLC, rather than to the BH RLC for BAP layer.

**--------------------Text Proposal for TS 38.322------------------------**

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| 6.2.3.2 Data field Data field elements are mapped to the Data field in the order which they arrive to the RLC entity at the transmitter.  For TMD PDU, UMD PDU and AMD PDU:  - The granularity of the Data field size is one byte;  - The maximum Data field size is the maximum size of a PDCP PDU in case the upper layer is PDCP.  For TMD PDU:  - Only one RLC SDU can be mapped to the Data field of one TMD PDU.  For UMD PDU, and AMD PDU:  - Either of the following can be mapped to the Data field of one UMD PDU, or AMD PDU:  - One RLC SDU;  - One RLC SDU segment. |

**Question 5: Do you agree with the above proposed change?**

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| **Companies** | **Agree or not?** | **Comments** |
| Ericsson | Disagree | While we understand the rapporteur intention, this section applies to TMD PDUs and that is, for example, SRB0. SRB0 is not associated to a PDCP entity. Thus, the highlighted sentence is already inaccurate. Adding the new text will make it worse. In any case, the BAP entity is just below the PDU in the IAB-donor, so the one BAP SDUs will be equal to a PDCP PDU. The IAB donor will deliver BAP PDUs with the size equal to a PDCP PDU plus the BAP headers, and BAP PDUs/SDUs will not increase within the intermediate IAB nodes.  If something related to the specifics of IAB is to be added, we suggest it is captured explicitly without really touching anything which could affect the legacy text. Nevertheless, we do not see at this moment anything specific. |
| Kyocera | Not sure | We think the current specification clearly mentions the maximum size is applied to PDCP PDU and no limitation for BAP PDU. So, we’re not sure if such a clarification is really necessary. |
| CATT | See comments | We understand the intention from rapporteur. But in the current spec, we think the “PDCP PDU” already has the intention that the upper layer is PDCP, not BAP. If the upper layer is BAP, there is no PDCP PDU. Thus, we think no need to add some limitation in the current spec.  If companies still want to capture some clarification for this issue, maybe adding a NOTE is sufficient. |
| ZTE | See comments | We think the issue raised in the [R2-2005523](file:///D:\\Documents\\3GPP\\tsg_ran\\WG2\\TSGR2_110-e\\Docs\\R2-2005523.zip" \o "D:Documents3GPPtsg_ranWG2TSGR2_110-eDocsR2-2005523.zip) should be discussed. But we don’t think the modification above is right. It is suggested to modify it as follows “The maximum Data field size is the maximum size of a PDCP PDU or BAP PDU”. |
| vivo | Not sure | We think the term TMD PDU is sufficient to imply that the upper sublayer is PDCP instead of BAP, but we are fine with the proposal as it makes the specification clearer. |
| Huawei | Agree | Since we have not define the maximum size of BAP PDU, it is better not to touch the BAP PDU part. In the current wording: The maximum Data field size is “the maximum size of a PDCP PDU” (let’s say X= the maximum size of a PDCP PDU), it means regardless the BAP/PDCP as upper layer, the max size is always one value “X”. This is not correct for the case with BAP as upper layer. |
| LG | Disagree | We can consider this with two aspects, i.e., F1-U traffic and non F1-U traffic.  For F1-U traffic, the current wording is correct and the proposed change is not needed because when generating all user plane traffic, the upper layer should be PDCP. Even though the upper layer is BAP at the IAB node while relaying F1-U data, the maximum data size of F1-U data is not changed and is still the maximum size of a PDCP PDU.  For non F1-U traffic except OAM, when generating non F1-U data, e.g., F1-C and SCTP heartbeat, and etc, the upper layer is not PDCP and we may not say that the maximum Data field size for this kind of data is the maximum size of a PDCP PDU. We guess that the rapporteur has concern on this case. However, basically non F1-U data is only for network node. We doubt whether the normative text needs to be updated to reflect network node signaling and behavior. So, we don’t think any change is needed for this. Nonetheless, If majority really wants to have some clarification for this, this should be a NOTE, not normative text. |
| Samsung | Agree with Note | We agree with the current proposal from rapporteur that NOTE: In case the upper layer is BAP, the maximum Data field size is the maximum size fo a BAP PDU. |

**Based on companies’ comments, rapporteur will provide the updated wording using a NOTE in the CR review phase to see if we can achieve the agreeable changes.**

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| 6.2.3.2 Data field Data field elements are mapped to the Data field in the order which they arrive to the RLC entity at the transmitter.  For TMD PDU, UMD PDU and AMD PDU:  - The granularity of the Data field size is one byte;  - The maximum Data field size is the maximum size of a PDCP PDU.  NOTE: In case the upper layer is BAP, the maximum Data field size is the maximum size of a BAP PDU.  For TMD PDU:  - Only one RLC SDU can be mapped to the Data field of one TMD PDU.  For UMD PDU, and AMD PDU:  - Either of the following can be mapped to the Data field of one UMD PDU, or AMD PDU:  - One RLC SDU;  - One RLC SDU segment. |

**Proposal 3: R2 to discuss whether to clarify in TS 38.322 by adding “NOTE: In case the upper layer is BAP, the maximum Data field size is the maximum size of a BAP PDU.”**

**Issue 4: Others**

Following two papers are resubmission from last meeting, which were marked as “not treated” by chair, since they are kind of clarifications and further enhancements.

[R2-2004780](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_110-e\Docs\R2-2004780.zip) Better cell selection for IAB Nodes Apple discussion Rel-16 38.304 NR\_IAB

[R2-2005142](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_110-e\Docs\R2-2005142.zip) PWS information handling in IAB Sony discussion Rel-16 NR\_IAB-Core R2-2002664

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| Clarifications and further enhancements – not treated  R2-2002664 PWS information handling in IAB Sony discussion Rel-16 NR\_IAB-Core R2-2000824  R2-2002814 Better cell selection for IAB Nodes Apple discussion NR\_IAB-Core |

Therefore, rapporteur assumes we will discuss those only if we have sufficient supporters, given that this is the very last meeting.

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| R2-2004780 | Proposal 1: Introduce a new set of Qrxlevmin, Qrxlevminoffset and PMax along with Qqualmin and Qqualminoffset for IAB Nodes for cell selection criteria. This is different from the ones which regular UEs use.  Proposal 2: Introduce a priority information among IAB parents in order for service classification and reduced latency.  Proposal 3: Allow IAB Nodes to select the best parent in terms of not only the best signal strength but also based on the best performance.  Proposal 4: Use # of hops as a metric along with signal strength as a cell selection criterion for IAB nodes. |
| R2-2005142 | Proposal: PWS System information is broadcasted once it is received from IAB-CU only. IAB node does not broadcast the information received in system information broadcasted from upstream/parent IAB-node. |

**Question 6: Companies are asked to provide your comments to the above proposals, if you support any of those. If you are fine to not discuss those for now, you can skip this question.**

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| **Companies** | **Comments** |
| Ericsson | About R2-2004780: These proposals can be brought up during Rel-17. It is too late to discuss new functionality when ASN.1 should be frozen in this meeting.  About R2-2005142: IAB nodes do not re-broadcast the system information which the parent node was broadcasting. Given so, we do not think there is anything to clarify |
| LG | Optimal cell mobility in multi-hop networks including idle mode mobility is interesting but really challenging topic, since the objective is often multi-dimensional, and there is trade-off relation among them. Given this, we should discuss this issue later releases. |
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**Summary: Those proposals can be considered in later releases, considering not enough support to discuss those for now in R16.**

# Conclusion and proposals

Based on the above summary, following proposals are given.

**Proposal 1: *cellReservedForOtherUse* is ignored by IAB-MT for cell barring determination, but still considered by NPN capable IAB-MT for determination of an NPN-only cell.**

**Proposal 2: IAB-MTs ignore the *cellReservedForFutureUse.***

**Proposal 3: R2 to discuss whether to clarify in TS 38.322 by adding “NOTE: In case the upper layer is BAP, the maximum Data field size is the maximum size of a BAP PDU.”**

# Reference

1. R2-2005406 [C502] Corrections to IAB behavior in Determining the NPN-only Cell CATT
2. R2-2004780 Better cell selection for IAB Nodes Apple
3. R2-2004783 Remaining issue on idle mode procedure for IAB-MT Kyocera
4. R2-2004784 Corrections to 38.331 for supporting IAB in NPN Huawei, HiSilicon, Kyocera
5. R2-2004785 Corrections to 38.304 for supporting IAB in NPN Huawei, HiSilicon, Kyocera
6. R2-2004876 Remaining issues of IAB in NPN CATT
7. R2-2005142 PWS information handling in IAB Sony
8. R2-2005516 Miscellaneous corrections to 38.304 for IAB Huawei, HiSilicon
9. R2-2005517 Miscellaneous corrections to 36.304 for IAB Huawei, HiSilicon
10. R2-2005523 Correction on RLC spec to support the BAP as upper layer Huawei, HiSilicon