3GPP TSG-RAN WG2 #119bis-e R2-22xxxxx

Online, October 10 - 19, 2022

Agenda Item: 8.12.1

Source: Qualcomm (Rapporteur)

Title: [AT119bis-e][020][eIAB] Reply LS on FS\_VMR solutions review

Document for: Discussion

# Introduction

This document captures the offline discussion:

* [AT119bis-e][020][eIAB] Reply LS on FS\_VMR solutions review (Qualcomm)

Scope: We attempt to reply to RAN2 topics (if any).

Intended outcome: Report if needed, Agreeable LS out.

Deadline: CB W2 Wed

The offline has the following phases:

**Phase I：Converge on reply to RAN2 topics. Deadline: Tuesday, October 18, 2022, 12:00 UTC.**

**Phase II：If needed.**

SA2’s LS to RAN2 (and RAN3) in R2-2209350 [1], contains the following information:

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| SA2 would like to inform RAN3 and RAN2 that the FS\_VMR study for Rel-18 has produced TR 23.700-05. Within the latest version of the TR 23.700-05, there are multiple solutions having RAN WG dependencies. SA2 plans to start the solution evaluation and conclusion development for the study.  SA2 noticed that RAN WGs have a related work item for Rel-18, i.e. NR\_mobile\_IAB, led by RAN3. In the WID RP-213601, section 8 indicated that coordination with SA2 is expected:  *Alignment and coordination with Rel-18 SA2 work on VMR should be considered, if needed.*  To evaluate the solutions and finish the conclusions, there are several key aspects or assumptions that need the feedback from RAN2 and RAN3:  …. |

This introduction is followed by 7 questions and a request for feedback on SA2’s TR 23.700-05.

ZTE provided a contribution in R2-2209615 [2], which addresses these 7 questions.

In the following discussion, we will aim to converge on answers to the questions in SA2’s LS considering ZTE’s contribution. A draft LS will be provided as soon as this discussion converges.

# 2 Discussion – Phase I

## 2.1 SA2 LS Question 1

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| With regard to Key Issue#1 (as defined in clause 5.1), SA2 would like to understand the necessary parameters for the operation of a Mobile Base Station Relay (MBSR), i.e. the mobile-IAB node. Would these parameters only be provided by OAM servers, or would additional parameters be required, including in roaming cases. |

R2-2209615 (ZTE) proposes to reply that the IP address of OAM server is pre-configured at the mobile IAB node. Other parameters could be obtained by the mobile IAB node from OAM, e.g., including DU ID, NCGI, PCI, TAC, PLMN, resource configurations, etc.

The Rapporteur believes that from RAN2 perspective, OAM configures the mobile IAB-node in the same way as a Rel-16/17 IAB-node. The OAM-based parameter configuration is out-of-scope for RAN2. Some parameters may also be configured by the IAB-donor as specified in TS 38.331 and TS 38.473. Roaming scenarios are not in RAN2 scope.

**Proposal 1: The reply to question 1 on mIAB-node parameter configuration:** *RAN2 assumes that the OAM configures the mobile IAB-node in the same way as a Rel-16/17 IAB-node. The OAM-based parameter configuration is not in RAN2 scope. Some parameters may also be configured by the IAB-donor as specified in TS 38.331 and TS 38.473. The roaming case is not in RAN2 scope.*

**Do you agree with this proposal? Comments?**

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| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Qualcomm | Yes |  |
| Apple |  | Although we think Rapporteur proposal is reasonable, we also think RAN2 is not in position to make the conclusion because whether OAM configures mobile IAB node is within RAN3 scope. To avoid possible misaligned response from RAN3, we prefer to response "This topic is not in RAN2 scope". |
| Ericsson | No - RAN3 should decide | Our comment is in line with Apple. RAN2 should not make assumption or decision for OAM as is not in the competences of this working group. Our understanding is that this reply is entirely up to RAN3.  We also prefer to reply: "This topic is not in RAN2 scope" |
| Samsung | No | Same view as Apple and Ericsson. |
| Kyocera | No | We have the same view as Apple, Ericsson and Samsung, although we also think the rapporteur’s suggestion is reasonable. So, we prefer to reply “This topic is not in RAN2 scope”. |
| LGE | No | We have sympathy with Apple and Ericsson. This should be replied by RAN3 and we are also ok with “This topic is not in RAN2 scope” for reply. |
| ZTE | No | This issue is suggested to be decided by RAN3. |
| Sharp | No | RAN3 issue |
| vivo | Yes, but | We can just say “OAM based is not in RAN2 scope”. |
| Lenovo | No | Agree with the companies above that it is decided by RAN3. |
| Intel | No | We share the same view with Apple and Ericsson. |
| Huawei, HiSilicon | No, but | Agree the comments that this is not in the scope. But, we have two folds:  “1, OAM based is not in RAN2 scope”, as proposed by vivo.  “2, Roaming case is not in the R18 RAN WI scope.”  Note that RAN2 may have some discussion on roaming. But, the point is that roaming is not considered as R18 Mobile IAB scope at all.  Therefore, we propose to only reply with the above two bullets. |
| Nokia | No | We also prefer to reply: "This topic is not in RAN2 scope" |
| Rapporteur |  | It seems we are converging to:  **Proposal 1: The reply to question 1 on mIAB-node parameter configuration: “***The OAM-based parameter configuration is not in RAN2 scope. The roaming case is not in RAN2 scope.”* |

## 2.2 SA2 LS Question 2

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| With regard to Key Issue#3 (as defined in clause 5.3), SA2 would like to understand if the MBSR, i.e. mobile-IAB node, would keep the same TAC, and Cell ID, when it changes serving donor gNB. SA2 has documented different solutions based on different options and needs RAN2 and RAN3 feedbacks for down selection. |

R2-2209615 (ZTE) proposes to reply that the TAC/Cell ID values broadcast in the system information of mobile IAB node may change as the mobile IAB node moves.

The Rapporteur’s view:

* The mIAB-node’s NCGI and PCI do not need to change during partial migration. The mIAB-node’s NCGI has to change during inter-donor DU migration. The change of the mIAB-node’s PCI during inter-donor DU migration is presently under RAN2 discussion.
* RAN2 still needs to discuss if TAC in the mobile IAB-node’s SIB broadcast should change when the mobile IAB-node moves. We can promise to provide SA2 with an update as this discussion progresses.

**Proposal 2: The reply to question 2 on the mIAB-node’s NCGI/TAC:** *The mobile IAB-node’s NCGI and PCI do not have to change during partial migration. The mobile IAB-node’s NCGI has to change during inter-donor DU migration. RAN2 is still discussing if the mobile IAB-node’s PCI has to change during inter-donor DU migration. RAN2 is also discussing if the mobile IAB-node’s TAC broadcast needs to change when the IAB-node is moving. RAN2 will provide updates to SA2 as the discussion progresses.*

**Do you agree with this proposal? Comments?**

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| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Qualcomm | Yes |  |
| Apple | Yes | We think the Rapporteur proposal well reflects RAN2 status. |
| Ericsson | Yes |  |
| Samsung | Yes but… | The final sentence may not be needed – we do not have to promise regular updates (and if we do – Is it just on this topic? Or other topics? And which ones? When will we send the next update / what will trigger the update or updates?). We will of course reply to any LSs and send LSs if and when appropriate.  But ok to follow majority on whether to include the last sentence.  Please also note that – based on the most recent developments in RAN3 discussion on this matter – their answer to this question may include the following statement: “The mobile IAB-node’s NCGI changes when the F1 terminating donor of the IAB-DU changes”. This may (or may not) correspond to what is referred to as inter-donor DU migration, but we should align the two reply-LSs (from RAN2 and RAN3) – and this refers to all questions. |
| Kyocera | Yes |  |
| LGE | Yes |  |
| ZTE | Yes, but | We can assume that the mobile IAB-node’s NGCI does not change during the partial migration procedure since the F1-terminating donor CU does not change. However, the mobile IAB-node’s PCI may change during partial migration suppose the PCI collision is detected with neighboring cells. It’s suggested to change the P2 as follows:  *The mobile IAB-node’s NCGI ~~and PCI~~ do not have to change during partial migration. The mobile IAB-node’s NCGI has to change during inter-donor DU migration. RAN2 is still discussing if the mobile IAB-node’s PCI has to change during partial migration and inter-donor DU migration. RAN2 is also discussing if the mobile IAB-node’s TAC broadcast needs to change when the IAB-node is moving. RAN2 will provide updates to SA2 as the discussion progresses.* |
| Sharp | Yes, but | Agree on ZTE’s comment |
| vivo | Yes |  |
| Lenovo | Yes | Agree on ZTE’s comment |
| Intel | Yes (mostly) with comments | We agree that this mostly reflects the current status. Regarding TAC, is it RAN2’s scope to discuss whether TAC needs to change when IAB node is moving? We haven’t discussed that yet. So prefer to say “RAN2 has not yet discussed whether *mobile IAB-node’s TAC broadcast needs to change when the IAB-node is moving or whether it is in RAN2 scope.”* |
| Huawei, HiSilicon | See comment | We prefer to use the RAN3 draft reply LS wording/agreement on NCGI  **The NCGI of the mobile IAB-DU cell is changed when the F1-terminating donor CU of the mobile IAB-DU is changed.** |
| Nokia | Yes, but with rewording | “inter-donor DU migration” can easily be mis-read as migration of the IAB node between any donor DUs.  We suggest re-wording to “inter-donor migration of the IAB-node’s DU”.  Since we haven’t started discussions on TAC broadcast yet, and RAN3 is still discussing this, we suggest re-wording to: “RAN2 will investigate if the mobile IAB-node's TAC should change” |
| Rapporteur |  | It seems we are converging to:  **Proposal 1: The reply to question 1 on mIAB-node parameter configuration:**  *The mobile IAB-node’s NCGI ~~and PCI~~ do****es*** *not have to change during partial migration. The mobile IAB-node’s NCGI ~~has to~~* ***is*** *change****d*** *during inter-donor* ***migration of the IAB-****DU ~~migration~~. RAN2 is ~~still~~* ***presently*** *discussing if the mobile IAB-node’s PCI has to change during ~~partial migration and~~ inter-donor* ***migration******of the IAB-****DU ~~migration~~. RAN2 is* ***presently*** *also discussing if the mobile IAB-node’s TAC broadcast needs to change when the IAB-node is moving. ~~RAN2 will provide updates to SA2 as the discussion progresses.~~* |

## 2.3 SA2 LS Question 3

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| Also, with regard to Key Issue#3, SA2 would like to understand details of the inter-IAB donor gNB mobility procedure for a MBSR, e.g. the feasibility of supporting NGAP messages containing multiple UE information during the handover procedure. |

R2-2209615 (ZTE) proposes to reply that it is feasible to support NGAP messages containing multiple UE information during the handover procedure, as already supported in R16/R17 in F1/E1AP messages.

The Rapporteur believes that this topic is not in RAN2 scope.

**Proposal 3: The reply to question 3 on the support of NGAP messages containing information of multiple UE contexts:** *This topic is not in RAN2 scope.*

**Do you agree with this proposal? Comments?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Qualcomm | Yes |  |
| Apple | Yes |  |
| Ericsson | Yes |  |
| Samsung | Yes |  |
| Kyocera | Yes |  |
| LGE | Yes |  |
| ZTE | Yes |  |
| Sharp | Yes |  |
| vivo | Yes |  |
| Lenovo | Yes |  |
| Intel | Yes |  |
| Huawei, HiSilicon | Yes |  |
| Nokia | Yes |  |
| Rapporteur |  | P3 seems to be fine with everybody. |

## 2.4 SA2 LS Question 4

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| With regard to Key Issue#4 (as defined in clause 5.4), SA2 would like to understand if IAB-node integration procedure or inter-IAB-donor gNB mobility procedure, or both, can be used for MBSR to integrate into the VPLMN. |

R2-2209615 (ZTE) proposes to reply that mIAB-node roaming is not supported.

The Rapporteur believes that roaming of mobile IAB-nodes is not in RAN2 scope.

**Proposal 4: The reply to question 4 on whether IAB-node integration/inter-donor-migration procedures can be used in a VPLMN:** *This topic is not in RAN2 scope.*

**Do you agree with this proposal? Comments?**

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| **Company** | **Yes/No** | **Comments** |
| Qualcomm | Yes |  |
| Apple | Yes |  |
| Ericsson | Yes |  |
| Samsung | Yes |  |
| Kyocera | Yes |  |
| LGE | Yes |  |
| ZTE | Yes |  |
| Sharp | Yes |  |
| vivo | Yes |  |
| Lenovo | Yes |  |
| Intel | Yes |  |
| Huawei, HiSilicon | Yes |  |
| Nokia | Yes |  |
| Rapporteur |  | P4 seems to be fine with everybody. |

## 2.5 SA2 LS Question 5

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| With regard to Key Issue#5 (as defined in clause 5.5), is it feasible for the IAB-donor gNB to identify that a UE is served by a MBSR (e.g. indicate TRP is mobile and the reference point is a MBSR/mobile). |

R2-2209615 (ZTE) proposes to reply to SA2 that it is feasible for the IAB-donor gNB to identify that a UE is served by a MBSR.

The Rapporteur believes that RAN2 should provide SA2 with RAN2’s agreements latest agreements:

* UE capability signalling is the baseline to let CU know that the MT is a “mobile-IAB” type. FFS early mobile-IAB indication, e.g. in Msg5.
* Regarding moving status/mode indication, R2 observes that legacy reporting of mobility state (e.g. *mobilityState-r16*) could be reused, and maybe also current location reporting from the UE. FFS whether any of this need to be enhanced or complemented, e.g. for the potential purpose of predictive mobility.

Based on these agreements, the IAB-donor-CU should be able to identify that a UE is served by the mobile IAB-node.

The Rapporteur believes that the example provided by SA2 in the bracket is out-of-scope for RAN2.

**Proposal 5: The reply to question 5 on whether it is feasible for the IAB-donor-CU to identify that a UE is served by a mobile IAB-node:**

*RAN2 has achieved the following agreements:*

* *UE capability signalling is the baseline to let CU know that the MT is a “mobile-IAB” type. FFS early mobile-IAB indication, e.g. in Msg5.*
* *Regarding moving status/mode indication, R2 observes that legacy reporting of mobility state (e.g. mobilityState-r16) could be reused, and maybe also current location reporting from the UE. FFS whether any of this need to be enhanced or complemented, e.g. for the potential purpose of predictive mobility.*

*RAN2 believes that based on these agreements, the IAB-donor-CU should be able to identify that a UE is served by the mobile IAB-node.* *RAN2 cannot comment on the example provided by SA2 in the bracket since it is non in RAN2 scope.*

**Do you agree with this proposal? Comments?**

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| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Qualcomm | Yes |  |
| Apple | Yes |  |
| Ericsson | Yes |  |
| Samsung | Yes |  |
| Kyocera | Yes |  |
| LGE | Yes | Fine to indicate two RAN2 agreements to deduce what RAN2 believe as formulated in the reply.  Regarding the second agreement, we can add the yellow for better understanding of SA1 (otherwise they would be confused about what the indication works for and how the following text is relevant)  *Regarding moving status/mode indication to let the IAB-donor-CU know the mobility status of the mobile-IAB, R2 observes that legacy reporting of mobility state (e.g. mobilityState-r16) could be reused, and maybe also current location reporting from the UE. FFS whether any of this need to be enhanced or complemented, e.g. for the potential purpose of predictive mobility.* |
| ZTE | Yes |  |
| Sharp | Yes |  |
| vivo | Yes |  |
| Lenovo | Yes |  |
| Intel | Yes |  |
| Huawei, HiSilicon | See comment | The question from SA2 does not even ask for the “moving status”. The question is only about the “a MBSR/mobile”, i.e. the type. So, the first agreement is sufficient. |
| Nokia | Yes |  |
| Rapporteur |  | The second agreement is indeed not needed for the reply to SA2’s question. This leads us to:  **Proposal 5: The reply to question 5 on whether it is feasible for the IAB-donor-CU to identify that a UE is served by a mobile IAB-node:**  *RAN2 has achieved the following agreement~~s~~:*   * *UE capability signalling is the baseline to let CU know that the MT is a “mobile-IAB” type. FFS early mobile-IAB indication, e.g. in Msg5.* * *~~Regarding moving status/mode indication, R2 observes that legacy reporting of mobility state (e.g. mobilityState-r16) could be reused, and maybe also current location reporting from the UE. FFS whether any of this need to be enhanced or complemented, e.g. for the potential purpose of predictive mobility.~~*   *RAN2 believes that based on these agreements, the IAB-donor-CU should be able to identify that a UE is served by the mobile IAB-node.* *RAN2 cannot comment on the example provided by SA2 in the bracket since it is non in RAN2 scope.* |

## 2.6 SA2 LS Question 6

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| Additionally, with regard to Key Issue#5, would NRPPa procedure for TRP location query be used by an LMF to obtain the MBSR location information? |

R2-2209615 (ZTE) proposes to reply to SA2 that NRPPa procedure for TRP location query can be used by an LMF to obtain the MBSR location information.

The Rapporteur believes that this issue is not in RAN2 scope.

**Proposal 6: The reply to question 6 on using the NRPPa procedure to obtain the mobile IAB-node’s TRP location:** *This topic is not in RAN2 scope.*

**Do you agree with this proposal? Comments?**

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| **Company** | **Yes/No** | **Comments** |
| Qualcomm | Yes |  |
| Apple | Yes |  |
| Ericsson | Yes |  |
| Samsung | Yes |  |
| Kyocera | Yes |  |
| LGE | Yes |  |
| ZTE | Yes |  |
| Sharp | Yes |  |
| vivo | Yes |  |
| Lenovo | Yes |  |
| Intel | Yes |  |
| Huawei, HiSilicon | Yes |  |
| Nokia | Yes |  |
| Rapporteur |  | P6 seems to be fine with everybody. |

## 2.7 SA2 LS Question 7

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| With regard to Key Issue#6 (as defined in clause 5.6), is it feasible for the IAB-donor gNB to provide an additional ULI (e.g. TAI/NG CGI information) for the MBSR to the AMF of the UE served by the MBSR, over NGAP together with the existing ULI for the UE? |

R2-2209615 (ZTE) proposes to reply to SA2 that it is not necessary for IAB-donor gNB to provide an addition ULI of mobile IAB-MT together with the existing ULI for UE to the AMF.

The Rapporteur believes that this question is not in RAN2 scope.

**Proposal 7: The reply to question 7 on the feasibility for the IAB-donor-CU to provide an ULI of the mobile IAB-node together with the UE’s ULI:** *This topic is not in RAN2 scope.*

**Do you agree with this proposal? Comments?**

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| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Qualcomm | Yes |  |
| Apple | Yes |  |
| Ericsson | Yes |  |
| Samsung | Yes |  |
| Kyocera | Yes |  |
| LGE | Yes |  |
| ZTE | Yes |  |
| Sharp | Yes |  |
| vivo | Yes |  |
| Lenovo | Yes |  |
| Intel | Yes |  |
| Huawei, HiSilicon | Yes |  |
| Nokia | Yes |  |
| Rapporteur |  | P7 seems to be fine with everybody. |

## 2.8 SA2 LS Request for feedback on TR 23.700-05

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| TR 23.700-05 includes several solutions with RAN impacts (as per the impacted functions clauses of each solution). Feedback on any of them is welcome. |

R2-2209615 (ZTE) does not propose to provide any feedback on the TR to SA2. The Rapporteur agrees.

**Proposal 8: The reply LS to not include any feedback on the TR.**

**Do you agree with this proposal? Comments?**

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| **Company** | **Yes/No** | **Comments** |
| Qualcomm | Yes |  |
| Apple | Yes |  |
| Ericsson | Yes |  |
| Samsung | Yes | Perhaps we should explicitly state that the statement from SA2 on their TR is noted, but that RAN2 did not carry out any analysis and does not provide any feedback on this occasion. |
| Kyocera | Yes |  |
| LGE | Yes |  |
| ZTE | Yes |  |
| Sharp | Yes |  |
| vivo | Yes |  |
| Lenovo | Yes |  |
| Intel | Yes |  |
| Huawei, HiSilicon | Yes |  |
| Nokia | Yes |  |
| Rapporteur |  | 13 companies presently support P8.  1 company would like to add that RAN2 hasn’t done any analysis on SA2’s TR.  SA’s LS does not explicitly ask for feedback on the TR. The Rapporteur believes that for that reason, RAN2 does not have to explicitly reply. |

# Discussion - Phase II

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# References

[1] [R2-2209350](file:///C:\Users\mtk65284\Documents\3GPP\tsg_ran\WG2_RL2\TSGR2_119bis-e\Docs\R2-2209350.zip) LS on FS\_VMR solutions review (S2-2207070; contact: Qualcomm), 3GPP RAN WG2 Meeting # 119bis-e, October 2022

[2] [R2-2209615](file:///C:\Users\mtk65284\Documents\3GPP\tsg_ran\WG2_RL2\TSGR2_119bis-e\Docs\R2-2209615.zip) Discussion on LS on VMR solutions from SA2, ZTE, Sanechips, 3GPP RAN WG2 Meeting # 119bis-e, October 2022