3GPP TSG-RAN WG3 #117bis-e R3-225936

Online, October 10 - 18, 2022

Agenda Item: 13.1

Source: Qualcomm (Moderator)

Title: Summary of CB: #IAB1\_General

Document for: Discussion

# Introduction

This paper captures the following CB discussion:

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| **CB: # IAB1\_General****- Discussion related to the LS from SA2 in R3-225317:** **- Should the Rel16 and Rel17 principle that the OAM configures the mobile IAB node be kept? Are currently configurable parameters sufficient or is there a need for more OAM configurable parameters?**  **- Should roaming scenarios be supported in Rel18?** **- Should any other WG be involved in the discussions of the LS from SA2?** **- Discuss and identify interdependencies between work ongoing in RAN3 and the questions asked by SA2** **- Discuss and identify enhancements that could be carried out in RAN3 to resolve the issues pointed in the LS** **- Discuss and identify RAN3 progress on mobile IAB to clarify the issues raised in the LS**(Qualcomm - moderator)Summary of offline disc [R3-225936](file:///C%3A%5CUsers%5Csksharma%5CDocuments%5CMobility%5CNew%20Focus%5CMobile%20IAB%5CR3_117bise%5CCB1_General%5CInbox%5CR3-225936.zip) |

The CB has the following phases:

**Phase I：Converge on open issues. Deadline is Wednesday, October 12, 2022, 12:00 UTC.**

**Phase II：If needed.**

The following contributions are included in this CB:

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| [R3-225357](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117bis-e%5CDocs%5CR3-225357.zip) | Workplan for Rel-18 mobile IAB (Qualcomm Inc. (Rapporteur)) | Work Plan |
| [R3-225317](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117bis-e%5CDocs%5CR3-225317.zip) | LS on FS\_VMR solutions review (SA2) | LS in |
| [R3-225344](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117bis-e%5CDocs%5CR3-225344.zip) | Discussion of SA2 FS\_VMR Solutions (Ericsson) | discussion |
| [R3-225358](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117bis-e%5CDocs%5CR3-225358.zip) | [Draft] Reply LS on FS\_VMR solutions review (Qualcomm Inc.) | LS out To: SA2 CC:  |
| [R3-225438](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117bis-e%5CDocs%5CR3-225438.zip) | Discussion on LS on VMR solutions from SA2 (ZTE) | discussion |
| [R3-225452](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117bis-e%5CDocs%5CR3-225452.zip) | Discussion on the questions from SA2 LS on VMR (Nokia, Nokia Shanghai Bell) | discussion |
| [R3-225453](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117bis-e%5CDocs%5CR3-225453.zip) | [draft] Reply LS on FS\_VMR solutions review (Nokia, Nokia Shanghai Bell) | discussion |
| [R3-225531](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117bis-e%5CDocs%5CR3-225531.zip) | [Draft] Reply to LS on FS\_VMR Solutions Review (Ericsson) | LS out To: SA2 CC: RAN, RAN2, RAN4 |
| [R3-225751](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117bis-e%5CDocs%5CR3-225751.zip) | Discussion on LS of FS\_VMR solutions review (Xiaomi) | discussion |

# For the Chairman’s Notes

**[To be updated].**

# Discussion - Phase I

The workplan in R3-225357 was floated on the reflector several before submission and no comments were received. The Moderator proposes that the workplan is marked as “noted”.

**Proposal 0: Workplan in R3-225357 to be marked as “noted”.**

**Q0: Do you agree with this proposal? Comments?**

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| **Company** | **Yes/No** | **Comments** |
| Qualcomm | Yes |  |
| MITRE | Yes |  |
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SA2 sent an LS to RAN3 in R3-225317, which 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.

R3-225344 (Ericsson), R3-225438 (ZTE), R3-225452 (Nokia) and R3-225751 (Xiaomi) provided discussion papers on the questions contained in this LS.

R3-225358 (Qualcomm) and R3-225531 (Ericsson) further contain draft reply-LSs to SA2.

In Phase 1, we will aim to converge on answers to the questions in SA2’s LS using the proposals from the above discussion papers and draft reply-LSs.

## 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. |

This question affects the non-roaming and the roaming scenario.

OAM-based parameter configuration for the **non-roaming** scenario:

R3-225344 (Ericsson) addresses the question by emphasizing that the OAM configures the mIAB-node in the same way as an Rel-16/17-node.

R3-225531 (Ericsson) proposes adding that RAN3 expects OAM connectivity to be supported while the mIAB-node moves, while more discussion would be required whether OAM connectivity may change during large distance travel.

R3-225438 (ZTE) provides specific examples for such OAM-configured parameters.

R3-225452 (Nokia) does not address the non-roaming case.

R3-225751 (Xiaomi) does not address how the mobile IAB-node obtains the parameters necessary for mIAB operation.

R3-225358 (Qualcomm) claims that OAM-parameter configuration is outside 3GPP scope and that other network-configured parameters are specified in TS 38.473 and TS 38.331. Also, RAN3 specifications do not mandate the IAB-node to be configured by OAM.

The Moderator’s view for the non-roaming case:

* OAM parameter configuration: RAN3 assumes that the OAM configures the mIAB-node in the same way as a Rel-16/17 IAB-node. OAM may configure additional parameters for mIAB-nodes beyond those configured for Rel-16/17 IAB-nodes. The OAM-based parameter configuration is out-of-scope for RAN3. The network-based parameter configuration is specified in TS 38.473 and TS 38.331.
* OAM connectivity: OAM connectivity is not mandated. However, RAN3 expects that the mIAB-node is OAM-connected while moving. RAN3 has not discussed whether OAM-connectivity may have to change when the mIAB-node moves over large distances.

**The Moderator proposes the following answer for the non-roaming case:**

**Proposal 1a: Reply to Q1 on the mIAB-node parameter configuration for the non-roaming case:** *For the non-roaming case, RAN3 assumes that the OAM configures the mIAB-node in the same way as a Rel-16/17 IAB-node. OAM may configure additional parameters for mIAB-nodes beyond those configured for Rel-16/17 IAB-nodes. The OAM-based parameter configuration is out-of-scope for RAN3. The network-based parameter configuration is specified in TS 38.473 and TS 38.331.*

*OAM connectivity is not mandated. However, RAN3 expects that the mIAB-node is OAM-connected while moving. RAN3 has not discussed whether OAM-connectivity may have to change when the mIAB-node moves over large distances.*

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

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| **Company** | **Yes/No** | **Comments** |
| Qualcomm | Yes |  |
| MITRE | Yes |  |
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OAM-based parameter configuration for the **roaming** scenario:

R3-225344 (Ericsson) emphasizes that the roaming scenario is not supported for Rel-18 mIAB.

R3-225531 (Ericsson) proposes a longer explanation for the reply LS on the issues related to roaming of IAB-nodes, e.g., security risk if IAB-node connects to the VPLMN’s OAM server.

R3-225452 (Nokia) states that for the roaming scenario, no additional parameters would have to be configured beyond those configured for the non-roaming IAB-DU. Further, secure connection establishment to OAM for the roaming scenario is out of scope for RAN3.

R3-225358 (Qualcomm) emphasizes that roaming scenarios are not in scope for Rel-18 mIAB.

The Moderator’s view for the roaming case:

* The roaming case is out-of-scope for Rel-18 mIAB. For that reason, we do not need to discuss any issues related to mIAB-roaming. However, since mIAB roaming has never been discussed, we cannot claim that it cannot be supported either.
* OAM-configuration for the roaming scenario has not been discussed either. Secure connection establishment to OAM in the roaming scenario indeed is out-of-scope for RAN3.

**The Moderator proposes the following answer for the roaming case:**

**Proposal 1a: Reply to Q1 on the mIAB-node parameter configuration for the roaming case:** *The roaming case is out-of-scope for Rel-18 mIAB. OAM-configuration and OAM-connectivity for roaming mIAB-nodes have not been discussed.*

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

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| **Company** | **Yes/No** | **Comments** |
| Qualcomm | Yes |  |
| MITRE | Yes |  |
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## 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. |

R3-225344 (Ericsson) proposes to discuss the static TAC solution in RAN3 and send an LS to RAN2 on the dynamic TAC solution.

R3-225531 (Ericsson) proposes a longer explanation on static vs. dynamic TAC solutions.

R3-225438 (ZTE) proposes to reply that the system info of the mIAB node may change when it moves.

R3-225452 (Nokia), R3-225751 (Xiaomi) and R3-225358 Qualcomm propose to reply that the mIAB-node’s NCGI does not need to be change during partial migration but that it has to change during full migration.

R3-225452 (Nokia) further proposes that it is up to the operator to configure same/different TAC on the mIAB-node when it changes the serving donor gNB.

R3-225358 (Qualcomm) wishes to clarify whether SA2’s reference to “Cell ID” refers to NCGI. Regarding TAC, the reply should be based on the outcome of the ongoing discussion in R3#117bis-e.

The Moderator’s view:

* The mIAB-node’s NCGI does not need to be change during partial migration but has to change during full migration.
* For the mIAB-node’s TAC, the reply LS should contain RAN3’s agreement on this topic achieved during this meeting, if any. If there is no agreement, The reply LS should contain that RAN3 is still discussing the matter.
* RAN3 does not have to send an LS to RAN2 on the TAC matter since RAN2 has already been included in SA2’s LS.
* RAN3 does not have to explain the static vs. dynamic TAC solutions to SA2 since SA2’s TR already discusses both solutions.

**The Moderator proposes the following answer:**

**Proposal 2a: Baseline reply to Q2 on the mIAB-node’s NCGI/TAC:** *The mIAB-node’s NCGI does not have to change during partial migration but it has to change during full migration. RAN3 is still discussing the handling of the mIAB-node’s TAC.*

**Proposal 2b: Update the above baseline reply based on agreements achieved in R3#117bise, if any.**

**Do you agree with these proposals? Comments?**

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| **Company** | **Yes/No** | **Comments** |
| Qualcomm | Yes |  |
| MITRE | Yes |  |
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## 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. |

R3-225344 (Ericsson) and R3-225358 (Qualcomm) propose that the reply on this question is pending RAN3 progress.

R3-225438 (ZTE) proposes to reply that supporting NGAP messages containing multiple UE information is feasible.

R3-225452 (Nokia) proposes to reply that the benefit of such message bundling is unclear.

R3-225751 (Xiaomi) proposes to include the latest progress on RAN3 discussion into the reply.

The Moderator’s view:

* The message bundling proposed by SA2 is feasible. RAN3 presently discusses whether there are any benefits to such message bundling. Based on the outcome, RAN3 may discuss if such message bundling will be supported.
* In case RAN3 achieves progress on this matter in this meeting, the reply should include such agreement.

**The Moderator proposes the following answer:**

**Proposal 3a: Baseline reply to Q3 on the bundling of UE messages on NGAP:** *The message bundling on NGAP proposed by SA2 is feasible. RAN3 presently discusses whether there are any benefits to such message bundling for mobile IAB, and whether such message bundling will be supported.*

**Proposal 3b: Update the above baseline reply based on agreements achieved in R3#117bise, if any.**

**Do you agree with these proposals? Comments?**

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| **Company** | **Yes/No** | **Comments** |
| Qualcomm | Yes |  |
| MITRE | Yes | We believe the message bundling would be beneficial. |
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## 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. |

R3-225344 (Ericsson) proposes to reply that mIAB-node roaming is not supported.

R3-225438 (ZTE), R3-225452 (Nokia) and R3-225751 (Xiaomi) propose to reply that the IAB-node integration and inter-donor mobility procedures can or may be used in a VPLMN, that it is at least feasible to use these procedures in a VPLMN, or that it is at least not precluded using these procedures in a VPLMN .

R3-225358 (Qualcomm) proposes to include that the IAB-node integration and IAB topology adaptation procedures defined in Rel-16/17 do not consider the IAB-node roaming scenario.

The Moderator’s view:

* As discussed for Q1, mIAB-node roaming is out-of-scope in Rel-18. Roaming was not considered in Rel-16/17 IAB, either. Since roaming has never been discussed, we cannot claim that IAB-node integration and IAB topology adaptation procedures can be used in a VPLMN, but we cannot preclude it either. The moderator believes that this somewhat captures the spirit of all contributions.

**The Moderator proposes the following answer:**

**Proposal 4: Reply to Q4 on whether IAB-node integration/inter-donor-migration procedures can be used in a VPLMN:** *IAB-node roaming was not discussed in Rel-16/17, and it is out-of-scope in Rel-18. RAN3 can therefore neither confirm nor preclude whether the integration/inter-donor-migration procedures will work in a VPLMN.*

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

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| **Company** | **Yes/No** | **Comments** |
| Qualcomm | Yes |  |
| MITRE | Yes |  |
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## 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). |

There is some confusion in the contributions on Q5, Q6 and Q7 since these three questions address similar issues that are related to same or similar key issues in SA2’s TR.

RAN3 replies should aim to stay close to the specific question asked. Q5 just asks if it is feasible for the donor to identify whether a UE is served by a mobile IAB-node. For that purpose, the donor needs to know that the UE’s gNB is a mobile IAB-DU. The question neither asks whether RAN3 considers supporting this functionality, nor how RAN3 would support this functionality in case RAN3 decided to do so.

All contributions either propose concrete ways on how to support such functionality, or they confirm that such functionality is feasible. Since RAN3 and RAN2 are still discussing the support of such functionality, the moderator proposes to just send a confirmation on the feasibility back to SA2.

**The Moderator proposes the following answer:**

**Proposal 5: Reply to Q5 on whether it feasible for the IAB-donor-CU to identify that a UE is served by a mIAB-node:** *RAN3 confirms that it is feasible for the IAB-donor-CU to identify that a UE is served by a mIAB-node.*

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

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| **Company** | **Yes/No** | **Comments** |
| Qualcomm | Yes |  |
| MITRE | Yes | Agree with Qualcomm that the scope of question is limited to feasibility only. |
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## 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? |

R3-225344 (Ericsson), R3-225438 (ZTE), R3-225452 (Nokia) and R3-225358 (Qualcomm) believe that the NRPPa procedure for TRP location query could be used by an LMF to obtain the mAB-node’s location information.

R3-225344 and R3-225531 (Ericsson) argue that enhancements should be considered to avoid a nested signaling solution.

R3-225452 (Nokia) proposes to provide more detailed information on what this TRP info could contain.

R3-225358 (Qualcomm) proposes to include that there is presently no RAN3 specification for the use of the NRPPa procedure for a TRP residing on an IAB-node

R3-225751 (Xiaomi) proposes RAN3 discussion on this topic as well as further clarification from SA2.

The Moderator’s view:

* There seems to be strong support that the NRPPa procedure could be used to obtain the location information of a TRP residing on a mIAB-node. However, the present RAN3 specification for the use of the NRPPa procedure does not explicitly address the TRP on an IAB-node. RAN3 has further not discussed if enhancements to NRPPa should be considered if used for mobile IAB. Since SA2 does not request from RAN3 to provide a full-fledged solution at this point, RAN3 should not start this discussion at this time.

**Proposal 6: Reply to Q6 on whether the NRPPa procedure would be used to obtain the mIAB-node’s location information:** *RAN3 confirms that the NRPPa procedure could be used to obtain the location of an mIAB-node’s TRP. However, there is presently no RAN3 specification for the use of the NRPPa procedure for this purpose. RAN3 has not discussed whether enhancements to NRPPa would have to be considered in case the procedure is used for mobile IAB.*

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

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| **Company** | **Yes/No** | **Comments** |
| Qualcomm | Yes |  |
| MITRE | Yes |  |
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## 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? |

R3-225344 (Ericsson), R3-225452 (Nokia) and R3-225358 (Qualcomm) agree that it is feasible for the IAB-donor-CU to provide an additional ULI for the mIAB-node to the AMF of the UE served by this mIAB-node.

R3-225438 (ZTE) believes that it is not necessary to provide this additional ULI. However, they do not deny the feasibility.

R3-225751 (Xiaomi) prefers to discuss how this can be done after one or more partial migrations. However, they do not preclude that it can be done.

R3-225358 (Qualcomm) emphasizes that details on how this would be done would need further RAN3 discussion.

The Moderator’s view:

* RAN3 already agreed that the IAB-donor should know about the IAB-node’s mobility. The IAB-donor also knows the cell where the mIAB-MT is connected to. It should therefore be possible for the IAB-donor-CU to provide this additional information with the UE’s ULI. How all of this is done would certainly require more discussion. This discussion would include the issue of partial migration, where the IAB-node is connected to two donors, where one of these donors knows about the IAB-MT’s cell while the other donor handles the UE’s ULI signaling.

**Proposal 7: Reply to Q7 on it is feasible for the IAB-donor-CU to provide an ULI of the mIAB-node together with the UE’s ULI to the UE’s:** *RAN3 believes that it is feasible for the IAB-donor-CU to provide an mIAB-node ULI together with the UE’s ULI to the UE’s AMF. RAN3 would need further discussion on the necessary signaling enhancements.*

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

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| **Company** | **Yes/No** | **Comments** |
| Qualcomm | Yes |  |
| MITRE | Maybe | Xiaomi has a good point that we need to understand (multiple) partial migrations first. |
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## 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. |

None of the contributions has proposed any feedback on the TR for the reply LS.

**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 |  |
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# Discussion - Phase II

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# References

[1] RP-221815, WID on Mobile IAB for NR, 3GPP TSG RAN#96, Budapest, Hungary, June 2022