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:

|  |
| --- |
| **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:\Users\sksharma\Documents\Mobility\New%20Focus\Mobile%20IAB\R3_117bise\CB1_General\Inbox\R3-225936.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:

|  |  |  |
| --- | --- | --- |
| [R3-225357](file:///D:\会议硬盘\TSGR3_117bis-e\Docs\R3-225357.zip) | Workplan for Rel-18 mobile IAB (Qualcomm Inc. (Rapporteur)) | Work Plan |
| [R3-225317](file:///D:\会议硬盘\TSGR3_117bis-e\Docs\R3-225317.zip) | LS on FS\_VMR solutions review (SA2) | LS in |
| [R3-225344](file:///D:\会议硬盘\TSGR3_117bis-e\Docs\R3-225344.zip) | Discussion of SA2 FS\_VMR Solutions (Ericsson) | discussion |
| [R3-225358](file:///D:\会议硬盘\TSGR3_117bis-e\Docs\R3-225358.zip) | [Draft] Reply LS on FS\_VMR solutions review (Qualcomm Inc.) | LS out To: SA2 CC: |
| [R3-225438](file:///D:\会议硬盘\TSGR3_117bis-e\Docs\R3-225438.zip) | Discussion on LS on VMR solutions from SA2 (ZTE) | discussion |
| [R3-225452](file:///D:\会议硬盘\TSGR3_117bis-e\Docs\R3-225452.zip) | Discussion on the questions from SA2 LS on VMR (Nokia, Nokia Shanghai Bell) | discussion |
| [R3-225453](file:///D:\会议硬盘\TSGR3_117bis-e\Docs\R3-225453.zip) | [draft] Reply LS on FS\_VMR solutions review (Nokia, Nokia Shanghai Bell) | discussion |
| [R3-225531](file:///D:\会议硬盘\TSGR3_117bis-e\Docs\R3-225531.zip) | [Draft] Reply to LS on FS\_VMR Solutions Review (Ericsson) | LS out To: SA2 CC: RAN, RAN2, RAN4 |
| [R3-225751](file:///D:\会议硬盘\TSGR3_117bis-e\Docs\R3-225751.zip) | Discussion on LS of FS\_VMR solutions review (Xiaomi) | discussion |

# For the Chairman’s Notes

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

**Proposal 1a: The reply to question 1 on mIAB-node parameter configuration:**

**“For the non-roaming case, RAN3 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 out-of-scope for RAN3. Some parameters may also be configured by the IAB-donor as specified in TS 38.473 and TS 38.331.”**

**Proposal 2a: The baseline reply to question 2 on the mobile IAB-node’s NCGI/TAC:**

**“The mobile IAB-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#117-bis-e, if any.**

**Proposal 3a: The baseline reply to question 3 on the support of NGAP messages containing information of multiple UE contexts:**

**“RAN3 presently discusses whether there are benefits to support NGAP messages containing information related to multiple UE contexts, and whether such bundling will be supported.”**

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

**Proposal 4: The reply to question 4 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.”**

**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:**

*“***RAN3 confirms that it is feasible for the IAB-donor-CU to identify that a UE is served by a mobile IAB-node. RAN3 has agreed: “The donor CU should know that the IAB node is “mobile”.” The example in the bracket related to TRP mobility is discussed in the reply to question 6.**

**Proposal 6: The reply to question 6 on using the NRPPa procedure to obtain the mobile IAB-node’s TRP location:**

**“RAN3 confirms that the NRPPa procedure could be used to obtain the location of the mobile IAB-node’s TRP. Enhancements to the NRPPa procedure may be needed to indicate that the TRP is mobile and that the TRP’s reference point is a mobile IAB-node. RAN3 is presently not discussing whether and how the NRPPa procedure can be used for the positioning of UEs that are served by a mobile IAB-node. Such discussion, if conducted, might require coordination with RAN2.”**

**Proposal 7a: The baseline 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:**

**“RAN3 believes that the feasibility of the signaling enhancement proposed by SA2 would need further assessment for partial migration scenarios, where IAB-MT and IAB-DU are connected to separate IAB-donors. RAN3 is currently discussing whether the TAC broadcast by the mobile IAB-cell should change with the IAB-node’s movement to reflect the IAB-node’s actual location. In this context, RAN3 will discuss if a signaling enhancement as proposed by SA2 would be needed. RAN3 will provide feedback as this discussion progresses.”**

**Proposal 7b: Update the above baseline reply based on agreements achieved in R3#117-bis-e, if any.**

# 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?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Qualcomm | Yes |  |
| MITRE | Yes |  |
| Huawei | Yes |  |
| ZTE | Yes |  |
| Xiaomi | Yes |  |
| Nokia | Yes |  |
| Deutsche Telekom | Yes |  |
| Lenovo | Yes |  |
| **Ericsson** | OK |  |
| Samsung | Yes |  |

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

SA2 sent an LS to RAN3 in R3-225317, which contains the following information:

|  |
| --- |
| 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?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Qualcomm | Yes |  |
| MITRE | Yes |  |
| Huawei | See comments | Suggest the following rewording to avoid confusing:  *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. Some parameters may also be configured by IAB-donor as ~~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.* |
| ZTE | See comments | We have not discussed whether additional parameters need to be configured for mobile IAB node. And we have not discussed the case that OAM connectivity have to change due to the movement of mobile IAB node. We are not sure whether it would help to include the second paragraph. So we suggest the following rewording based on Huawei’s version:  *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. Some parameters may also be configured by IAB-donor as ~~The network-based parameter configuration is~~ specified in TS 38.473 and TS 38.331.* |
| Xiaomi | See comments | Agree with ZTE’s version. |
| Nokia | See comments | The 2nd paragraph is not needed. IAB is a network device, so OAM connection is always needed, and it is not just for configuration.  Ok for ZTE proposal. |
| Deutsche Telekom | See comments | We prefer the changes proposed by Huawei/ZTE for the first paragraph.  For the second paragraph only the first sentence of Huawei’s proposal may be needed for clarification of RAN3’s view, i.e., RAN3 expects that the mIAB-node is OAM-connected while moving |
| Lenovo |  | Agree with ZTE’s version. |
| **Ericsson** | **Prefer ZTE’s version** |  |
| Samsung | See comments | Agree with ZTE’s version. |

**Summary:**

2 companies support the moderator’s proposed reply.

Huawei and ZTE propose a modified wording.

6 Companies support ZTE’s rewording (including ZTE).

One company (DT) would like to keep “RAN3 expects that the mIAB-node is OAM-connected while moving” contained in the original wording.

The moderator believes that ZTE’s rewording captures the essence of the question. The moderator also agrees with DT that the additional statement on continued OAM-connectivity during operation is correct. At the same time, RAN3 does not insist that OAM connectivity is always provided. Further, SA2 is primarily concerned about parameter configuration rather than OAM connectivity. For that reason, everything removed by Huawei and ZTE is not really needed to answer SA2’s question. The moderator proposes to go with ZTE’s rewording.

**Proposal 1a: The reply to question 1 on mIAB-node parameter configuration:**

**“For the non-roaming case, RAN3 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 out-of-scope for RAN3. Some parameters may also be configured by the IAB-donor as specified in TS 38.473 and TS 38.331.”**

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?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Qualcomm | Yes |  |
| MITRE | Yes |  |
| Huawei | Yes |  |
| ZTE | Yes |  |
| Xiaomi | Yes |  |
| Nokia | Yes |  |
| Deutsche Telekom | Yes |  |
| Lenovo | Yes |  |
| **Ericsson** | Yes |  |
| Samsung | Yes |  |

**Proposal 1b: The reply to question 1 on mIAB-node parameter configuration:**

**“The roaming case is out-of-scope for Rel-18 mIAB. OAM-configuration and OAM-connectivity for roaming mobile IAB-nodes have not been discussed.”**

## 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?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Qualcomm | Yes |  |
| MITRE | Yes |  |
| Huawei | Yes |  |
| ZTE | Yes |  |
| Xiaomi | Yes |  |
| Nokia | Yes |  |
| Deutsche Telekom | Yes |  |
| Lenovo | Yes |  |
| **Ericsson** | Yes | “RAN3#117-bis-e” it is |
| Samsung | Yes |  |

**Proposal 2a: The baseline reply to question 2 on the mobile IAB-node’s NCGI/TAC:**

**“The mobile IAB-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#117-bis-e, if any.**

## 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?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Qualcomm | Yes |  |
| MITRE | Yes | We believe the message bundling would be beneficial. |
| Huawei | See comments | We haven’t study the NG based HO in RAN3, and the group signaling for Xn based HO is still under discussion. So suggest the following rewording: *RAN3 has not discussed whether it is feasible for 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.* |
| ZTE | Yes | We believe that message bundling on NGAP proposed by SA2 is technically feasible. And the benefits and whether to support message bundling is under discussion in RAN3. |
| Xiaomi | Yes | Support the moderator’s proposal |
| Nokia | See comments | The benefit for Xn group signaling is under discussion, and no discussion on NG-based HO. So small modification on HW text  *RAN3 has not discussed whether it is feasible for the message bundling on NGAP ~~proposed by SA2 is feasible~~. RAN3 is discussing ~~presently discusses~~ whether there are any benefits to such message bundling for mobile IAB~~, and whether such message bundling will be supported~~.* |
| Deutsche Telekom | See comments | We are fine with Nokia’s proposal because of current discussion status. |
| Lenovo | See comments | The feasibility of message bundling for UEs is still under discussion in RAN3.  So, we may only need to delete the following sentence.  *~~The message bundling on NGAP proposed by SA2 is feasible.~~* |
| **Ericsson** | **Yes, with rewording** | * Not even the opponents of group signalling over NGAP question the feasibility, they instead have concerns on benefits. Hence we prefer QC’s version, with rewording. * This is not exactly message bundling. It should be referred to as ***“signaling of information related to multiple UE contexts in a single message”.*** |
| Samsung | See comments | Prefer Huawei’s rewording |

**Summary:**

There are different views on the feasibility of message bundling on NGAP.

5 (10) companies believe that such message bundling is technically feasible. One of these 4 companies (Ericsson) prefers rewording of “bundling” to “support of signaling of information related to multiple UE contexts in a single message”.

5 (10) companies prefer to state that such message bundling on NGAP has not yet been discussed by RAN3.

The moderator does not see any reason why message bundling on NGAP would not be possible from protocol perspective, and nobody here has given any reason why this shouldn’t work. The moderator further believes that nobody would seriously disagree at this point. This of course raises the question why SA2 would even ask for the feasibility of such message bundling if it is so obvioius.

It seems that there are alternative interpretations of the term “feasible”. The 5 opposing companies to this “feasibility of message bundling” as well as SA2 may seem to refer to 1) potential benefits identified, and/or 2) potential obstacles identified (e.g., from procedural perspective). These issues are presently under discussion RAN3.

Since the term “feasibility” seems to be controversial, the moderator suggests to only keep the second statement on RAN3’s present discussion and avoid any reference to the term “feasibility”. The moderator further proposes a rewording, which takes Ericsson’s comment into account and better aligns the reply with SA2’s question.

**Proposal 3a: The baseline reply to question 3 on the support of NGAP messages containing information of multiple UE contexts:**

**“RAN3 presently discusses whether there are benefits to support NGAP messages containing information related to multiple UE contexts, and whether such bundling will be supported.”**

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

## 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?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Qualcomm | Yes |  |
| MITRE | Yes |  |
| Huawei | Yes |  |
| ZTE | Yes |  |
| Xiaomi | Yes |  |
| Nokia | Yes |  |
| Deutsche Telekom | Yes |  |
| Lenovo | Yes |  |
| **Ericsson** | Yes, but without the second sentence | The main message is that roaming is out of scope, and the discussion should stop there. |
| Samsung | Yes |  |

**Summary:**

9 (10) companies are fine with the moderator’s wording.

1 (10) is fine with the first sentence but prefers removal of the second sentence.

There is strong support in keeping the second sentence. The moderator believes that the second sentence is the one that aims to answer SA2’s question. The first sentence primarily motivates the second sentence but by itself, it doesn’t really answer SA2’s question. We therefore keep both sentences.

**Proposal 4: The reply to question 4 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.”**

## 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?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Qualcomm | Yes |  |
| MITRE | Yes | Agree with Qualcomm that the scope of question is limited to feasibility only. |
| Huawei | See comments | We think it is feasible that the IAB-donor know that the UE is served by a mobile IAB-node, but the question from SA2 has the bracket (e.g. indicate TRP is mobile and the reference point is a MBSR/mobile), apparently, RAN3 didn’t discussed whether the IAB donor can indicate the TRP is mobile to the LMF or not. So the proposed answer from the moderator may somehow cause confusing. Suggest the following rewording:  *RAN3 confirms that it is feasible for the IAB-donor-CU to identify that a UE is served by a mIAB-node, but RAN3 has not discussed whether it is feasible for the IAB-donor to indicate the TRP is mobile and the reference point is a MBSR/mobile, it is out-of-scope for Rel-18 mobile IAB.* |
| ZTE | Yes |  |
| Xiaomi | Yes | The question is asking feasibility, we agree with the moderator’s proposal. In addition, we should ask for clarification on whether the UEs means on-board UEs or all the UEs connected to the m-IAB, as if it’s surrounding UEs, known it served by mobile IAB will not bring any benefit for positioning a surrounding UE.  And we would like to further discuss the possible enhancement on NRPPa. |
| Nokia | Yes with comments | The SA2 LS also have another question in bracket (e.g. indicate TRP is mobile and the reference point is a MBSR/mobile), and this bullet is related to Q6. It is better to mention the SA2 question in bracket is addressed in answer to Q6.  *RAN3 confirms that it is feasible for the IAB-donor-CU to identify that a UE is served by a mIAB-node. The SA2 question “*(e.g. indicate TRP is mobile and the reference point is a MBSR/mobile).*” Is covered by the answer to Q6.* |
| Deutsche Telekom | Yes with addtitions | We support the change proposed by Nokia. |
| Lenovo | Yes |  |
| **Ericsson** | Yes, but with additions | We don’t understand why the moderator removed the part of the question between parenthesis:  *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).*  If the answer is YES to Q5, then it applies to the entire sentence, so the yellow part should be added into the answer. In this regard we agree with Nokia’s reformulation.  This answer is inconclusive, in the sense that RAN3 does not state whether we will discuss this or not. **We need a statement clarifying this.** |
| Samsung | Yes | Since the TRP is bundled with mobile IAB node, it is feasible for the IAB-donor gNB to indicate the TRP is mobile. |

Summary:

There seems to be agreement on the moderator’s suggested reply.

However, there is controversy if additional information is need to address the bracket in SA2’s question “(e.g. indicate TRP is mobile and the reference point is a MBSR/mobile).”

Huawei proses adding: “…but RAN3 has not discussed whether it is feasible for the IAB-donor to indicate the TRP is mobile and the reference point is a MBSR/mobile, it is out-of-scope for Rel-18 mobile IAB.”

Xiaomi would like to clarify if this would apply to onboard UEs or all UEs, and to discuss potential enhancements to NRPPa.

Nokia, DT, and Ericsson would like to add a reference to Q6 related to this example in the bracket.

Qualcomm, MITRE, ZTE, Lenovo, and Samsung agree with the moderator’s wording.

The example in the bracket seems to refer to NRPPa discussed in question 6. The moderator therefore agrees that it would be helpful including an explicit reference to Q6. It may further be helpful to include RAN3’s agreement on this topic to the reply: “**The donor CU should know that the IAB node is “mobile”.**”

**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:**

*“***RAN3 confirms that it is feasible for the IAB-donor-CU to identify that a UE is served by a mobile IAB-node. RAN3 has agreed: “The donor CU should know that the IAB node is “mobile”.” The example in the bracket related to TRP mobility is discussed in the reply to question 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? |

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?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Qualcomm | Yes |  |
| MITRE | Yes |  |
| Huawei | No | Based on our understanding, in SA2 Key issue#5, the LMF needs to know the TRP in mobile IAB node is mobile in advance, and then it can initiate TRP location query to obtain the location of the mobile IAB-DU’s location. But how will the LMF know that the TRP is mobile is unclear, and R3 didn’t discussed this before. So, we think it is hard to give feedback on this issue at current stage. |
| ZTE | Yes |  |
| Xiaomi | Yes |  |
| Nokia | Yes with comments | This is related to Q5 “(e.g. indicate TRP is mobile and the reference point is a MBSR/mobile)” This also address HW’s concern on how LMF know a TRP is mobile. Current NRPPa TRP Information Exchange procedure allows the LMF to request the NG-RAN node to provide detailed information for TRPs hosted by the NG-RAN node. Similar as F1AP TRP Information Exchange procedure, the detailed information for TRP can be TRP’s geo-coordinates, which can be geographical position of the antenna of the cell/TRP, or a referenced position including the ID of the reference point and relative coordinate of the antenna of the cell/TRP. It is straightforward to use it for mobile IAB.  For the proposal, there is no need for “*However, there is presently no RAN3 specification for the use of the NRPPa procedure for this purpose.*” since mobile IAB is not in any RAN3 spec yet. Please delete this sentence.  *RAN3 confirms that the NRPPa procedure could be used to obtain the location of an mIAB-node’s TRP, and indicate TRP is mobile and the reference point is a MBSR/mobile. ~~However, there is presently no RAN3 specification for the use of the NRPPa procedure for this purpose.~~ RAN3 has not discussed the detail ~~any whether enhancements to NRPPa would have to be considered~~ in case the NRPPa procedure is used for mobile IAB.* |
| Deutsche Telekom | Yes with comments | We support Nokia’s proposal. |
| Lenovo | Yes |  |
| **Ericsson** | See comments | There is a misunderstanding of the question and perhaps unfamiliarity with the positioning procedures in F1AP. We try to address below the confusion from moderator:  First, NRPPA is indeed terminated at the gNB-CU as hinted above by QC, but since TRPs are part of the gNB-DU, 3GPP RAN3 has already defined since Rel-16 positioning messages equivalent to the NRPPA’s ones (when needed) in F1AP. Please check TS 38.473 section 8.13, especially 8.13.8 describing the dedicated TRP Information Exchange procedure for providing local TRP information from a DU to CU, then back to LMF over the equivalent NRPPA message defined in TS 38.455.  Second, the purpose of question 6 from SA2 is to give hints how a MBSR/Mobile TRP’s location can be known after the MBSR has relocated. In previous releases the TRP is static; when LMF/gNB-CU sends TRP information request to gNB-CU/TRP the gNB-CU/TRP can provide e.g. the “Geographical Coordinates” of the TRP back to LMF/gNB-CU as stated by Nokia. The “Geographical Coordinates” are initially set up by OAM. Now in Rel-18 SA2 SI, there is a study of location service for mobile IAB-node. The question from SA2 is whether it is possible for the mobile IAB-node to provide its own location info to LMF over NRPPA **and F1AP,** as consequence of the positioning functions being mirrored over F1AP.  Since the IAB-node moves, the mobile IAB node needs to be considered as UE to derive its own position, triggering a new location request from LMF for this mobile TRP in order to use if for computing the UE's location. See our discussion paper R3-225344 explaining this.  Regarding the reformulation proposed by Nokia, we support it with the following addition highlighted in yellow: “*RAN3 has not discussed the details in case the NRPPa procedure****used for UE positioning can be****used for mobile IAB. This needs more coordination with RAN2"*  This answer is also inconclusive, in the sense that RAN3 does not state whether we will discuss this or not. **We need a statement clarifying this.** |
| Samsung | Yes | NRPPa procedure is out of scope of Rel-18 IAB, and RAN3 has not discussed it. |

**Summary:**

5 (10) companies support the moderator’s proposed reply.

5 (10) companies are not happy with the moderator’s original wording. Huawei, Nokia and Ericsson emphasize that the LMF has to know that the mobile IAB-node’s TRP is mobile, and that this needs more RAN3 discussion, potentially with RAN2 involvement. Nokia proposes a rewording, which is then further reworded by Ericsson. The moderator agrees that these aspects need to be captured in the reply. The proposed wording by Nokia/Ericsson includes that the NRPPa procedure could indicate that the TRP is mobile and that the reference point is a mobile IAB-node. This reflects an enhancement to NRPPa, which has not yet been discussed by RAN3. Presently, RAN3 does not even have this discussion on the agenda. This fact should be disclosed to SA2. We could add that such discussion, if conducted, might require RAN2 involvement.

The moderator therefore proposes the following reply:

**Proposal 6: The reply to question 6 on using the NRPPa procedure to obtain the mobile IAB-node’s TRP location:**

**“RAN3 confirms that the NRPPa procedure could be used to obtain the location of the mobile IAB-node’s TRP. Enhancements to the NRPPa procedure may be needed to indicate that the TRP is mobile and that the TRP’s reference point is a mobile IAB-node. RAN3 is presently not discussing whether and how the NRPPa procedure can be used for the positioning of UEs that are served by a mobile IAB-node. Such discussion, if conducted, might require coordination with RAN2.”**

## 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?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Qualcomm | Yes |  |
| MITRE | Maybe | Xiaomi has a good point that we need to understand (multiple) partial migrations first. |
| Huawei | No | Based on the moderator’s analysis, for partial migration, “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.” Then, we are not sure it is still “feasible” for the IAB-donor-CU to provide an mIAB-node ULI together with the UE’s ULI to the UE’s AMF. |
| ZTE | No | According to TR 23.700, the motivation for the additional ULI provision for the mobile IAB-MT together with the ULI of UEs served the mobile IAB-DU is to address the problem of cell ID/TAC of MBSR not reflecting the location of the UE.  Therefore the issue depends on whether TAC broadcast by mobile IAB cell would change due to movement to reflect the actual location, which is still under discussion in RAN3. And two options are on the table currently, i.e. the static TAC, and the dynamic TAC. If the latter option is adopted, the issue mentioned in Q7 doesn’t exist. Thus there is no need for the the IAB-donor-CU to provide an ULI of the mIAB-node together with the UE’s ULI. We cannot reply that the enhancement is needed when the issue is not justified yet. so let’s wait for the progress on the TAC issue. And we suggest the following reply to Q7:  *This issue depends on whether TAC broadcast by mobile IAB cell would change due to movement to reflect the actual location. RAN3 has no conclusion on this yet. RAN3 would provide feedback based on the progress on the TAC broadcast issue.* |
| Xiaomi | Yes but | We should clearly state the scenario of multiple partial migrations, SA2 can consider it to decide whether the additional ULI is useful or not. |
| Nokia | See comments | It is feasible to add a new IE, but it is unclear whether it is needed (refer to comments from HW/ZTE). |
| Deutsche Telekom | No | We share the concerns raised by HW and ZTE. The alternative proposal by ZTE seems to address the discussion status correctly and can be used as basis for a feedback to Q7. |
| Lenovo |  | Agree with the ZTE’s version. |
| **Ericsson** | Yes | Not sure what “further discussion” is needed and how mentioning the second red sentence to SA2 is informative in any way. |
| Samsung | Yes |  |

Summary

3 (10) companies support the moderator’s proposed reply. One of them would like to discard the second sentence.

4 (10) companies provide a different wording proposed by ZTE.

3 (10) companies (Huawei, Xiaomi and MITRE) would like to emphasize that there is a problem during partial migration, where the IAB-node is connected to two donors and the donor of the MT’s ULI is not the same as that handling the UE’s ULI.

The moderator agrees with this issue raised by Huawei, Xiaomi and MITRE. We may want to capture this aspect in the reply.

ZTE emphasizes that the signaling enhancement proposed by SA2 may be feasible, but it may not be needed, and that the need for such signaling enhancement is currently under RAN3 discussion. The moderator would like to emphasize that the need for this signaling enhancement needs to be established if TAC changes or remains the same with IAB-node mobility. The moderator therefore suggests emphasizing that RAN3 is presently discussing the TAC-related matter, and that based on this discussion, RAN3 will determine if such signaling enhancement is needed.

**Proposal 7a: The baseline 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:**

**“RAN3 believes that the feasibility of the signaling enhancement proposed by SA2 would need further assessment for partial migration scenarios, where IAB-MT and IAB-DU are connected to separate IAB-donors. RAN3 is currently discussing whether the TAC broadcast by the mobile IAB-cell should change with the IAB-node’s movement to reflect the IAB-node’s actual location. In this context, RAN3 will discuss if a signaling enhancement as proposed by SA2 would be needed. RAN3 will provide feedback as this discussion progresses.”**

**Proposal 7b: Update the above baseline reply based on agreements achieved in R3#117-bis-e, if any.**

## 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?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Qualcomm | Yes |  |
| Huawei | Yes |  |
| ZTE | Yes |  |
| Xiaomi | Yes |  |
| Nokia | Yes |  |
| Deutsche Telekom | Yes |  |
| Lenovo | Yes |  |
| **Ericsson** | Yes |  |
| Samsung | Yes |  |

# 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