3GPP TSG-RAN WG2 #110-e R2- 200xxx

**Electronic Meeting, 1st – 10th June 2020**

Agenda Item: x.x.x

Source: Ericsson (rapporteur)

Title: Report on email discussion [Post109bis-e][920][IAB] RRC 2

Document for: Discussion, Decision

# Introduction

This document captures the following email discussion:

* [Post109bis-e][920] IAB RRC 2 (Ericsson)

**Scope :** Open issues including Solutions (including ASN.1 RIL handling)

The open issues presently include: Impact from agreements by RAN3#107e-bis: IP signaling, others. See Rap summary of RAN3 agreements. Barring of intraFreqReselection field description in MIB for IAB-MT. Proposal 5 of UP offline at 109bis-e, Corrections/clarifications, e.g., on defaultUL-BH-RLC-Channel-r16, bh-RLC-ChannelToReleaseList-r16 pointed out by Nok (Dawid) etc

**Intended outcome:** Agreeable CR updates, Report.

**Deadline :** Next meeting + follow ASN.1 review deadlines.

# Known Open issues

Below the remaining editor’s notes in the endorsed IAB RRC CR (R2-2004287) are discussed.

## Issue IAB\_1 (RRC Release to INACTIVE)

5.3.8.3 Reception of the *RRCRelease* by the UE

Editor’s note: It is FFS if there is a need for the BAP entity to be released/suspended on transition to INACTIVE mode.

RAN2 agreed that INACTIVE mode is optional for IAB-MTs, hence, some IAB-MTs may support this feature while others might not. The rapporteur does not think there is a need to capture anything in the spec regarding the BAP entity, as there is no BAP suspend procedure to be applied (as compared to the PDCP case, where the sequence numbers have to be reset and buffered data has to be discarded or delivered).

**Question 1: Do companies agree with the proposed way forward that no specific handling of the BAP entity is required during the transition of an IAB-MT to INACTIVE state?**

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| **Company** | **Suggested resolution/company comments** |
| QC | We agree with rapporteur that nothing needs to be captured in the spec for RRC\_INACTIVE. |
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**Summary:**

## Issue IAB\_2 (BH-RLC-ChannelID)

6.3.2 BH-RLC-ChannelID

BH-RLC-ChannelID-r16 ::= FFS

Two options i.e., ENUM and CHOICE have been discussed for the BH-RLC-ChannelID IE. The proponents for ENUM structure argue that this is a new IE and has no dependence on any other IE, hence, we can select any type of structure for BH-RLC-ChannelID. On the other hand, the proponents for CHOICE argue that there is a direct dependency between BH RLC Channel and BH Logical Channels. The basic mandatory functionality requires to support 32 BH Logical Channel IDs. Thus, only 32 BH RLC Channel IDs are required. Only those IABs which support the extended BH Logical ID range must also support the extended BH RLC Channel ID range. This is an optional capability and the IEs to configure the additional capability do not need to be implemented or supported by IAB nodes not supporting the capability. Also, the ENUM type does not allow separating the support of the two different ranges and adds additional overhead for all the cases.

**Question 2: Companies are kindly asked to provide their preferred option with technical motivation for the structure of BH-RLC-ChannelID.**

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| **Company** | **ENUM/CHOICE/Any other type** | **Technical motivation/Comments** |
| QC | BIT STRING (SIZE (16)) | This is the same parameter specified in 38.473. We should align with 38.473 which has the following IE:9.3.1.x BH RLC Channel ID This IE uniquely identifies a BH RLC channel for an IAB-node and IAB-donor-DU.   |  |  |  |  |  | | --- | --- | --- | --- | --- | | IE/Group Name | Presence | Range | IE type and reference | Semantics description | | BH RLC CH ID | M |  | BIT STRING (SIZE(16)) |  | |
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**Summary**:

# Other RAN2 issues

The following issues were raised during RAN2-109bis-e discussion.

## Issue IAB\_3 (Remaining RACH issues)

In [AT109bis-e][020] the remaining RACH issues were discussed, and it was agreed to continue discussing the following two alternatives in this email discussion:

**RAN2 to choose one of the following two options for the special case of Msg1-based SI request:  
 A: IAB-MT should always use RACH-ConfigCommon if configured;  
 B: add IAB-specific si-RequestPeriod and si-RequestResources in the SI-RequestConfig.**

The rapporteur understands that the second option separates or has different sets of parameters for UE and IAB-MT, which was also asked by RAN1 in the LS for L1 parameters. However, the rapporteur would like to ask other companies about their viewpoint on this issue.

**Question 3: Companies are kindly asked to provide their preferred option with technical motivation for IAB specific RACH configuration.**

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| **Company** | **Option (A/B)** | **Technical motivation/Comments** |
| QC | B | Just for clarification: SI RequestInfo uses RACH-ConfigGeneric, not RACH-ConfigCommon. The question seems to be if IAB uses the plain RACH-ConfigGeneric (A) of if it also applies the IAB-specific three parameters (B). These three parameters would then have to be placed into RACH-ConfigGeneric, as it is already the case in the latest endorsed RRC CR R2-2004387. Is this assessment correct? |
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**Summary:**

## Issue IAB\_4 (IP address allocation)

In RAN2-109bis-e online session for IAB WI, some companies brought the UE assistance information message for IP address request on the table and the Chair agreed to further discussed this issue in the RRC discussion. Hence, we are back to the discussion of whether to use a new RRC message or update the UEAssistanceInfo message for IP address request for both SA and NSA cases.

**Question 4: Companies are kindly asked to provide their preferred option with technical motivation for the IP address request message.**

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| **Company** | **New RRC message/Update UEAssistanceInfo** | **Technical motivation/Comments** |
| QC | See comment | This relates to Q5. Most importantly, we should use one and the same UL message for IP address request for CU-assigned addresses and IP address report for OAM-configured IP addresses. We don’t have a specific preference for the message type. |
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**Summary**:

# Agreements from RAN3#107bis-e

## Issue IAB\_5 (RRC Message Design for IP Address Allocation)

RAN3-107bis-e concluded that the RRC signaling for IAB IP address allocation should enable:

For **IAB-donor-based IP address allocation**:

An IAB-node can request from the IAB-donor-CU via UL RRC message:

One 64-bit IPv6 address prefix or up to 8 full IPv6 addresses per specific usage, and/or

Up to 8 full IPv4 addresses per specific usage.

Specific IP address/prefix usages are: F1-C traffic, F1-U traffic and non-F1 traffic.

The IAB-donor-CU indicates to the IAB-node via DL RRC message the full IPv6 addresses or IPv6 address prefixes and/or IPv4 addresses and the specific usage of each allocated full address and/or prefix.

For **OAM-based IP address allocation**:

For OAM-based IP address allocation, the IAB-node indicates to the IAB-donor-CU via UL RRC message:

One 64-bit IPv6 address prefix or up to 8 full IPv6 addresses, and/or

Up to 8 full IPv4 addresses.

For each IP address/prefix allocated by the OAM, the IAB-node also indicates the specific usage.

The same maximum number of allocated addresses/prefixes as for the IAB-donor-based IP address allocation applies.

Specific IP address/prefix usages are: F1-C traffic, F1-U traffic and non-F1 traffic.

The purpose of indicating the OAM-allocated IP addresses to the IAB-donor-CU is to enable the IAB-donor-CU to configure the IAB-donor-DU with the mapping between the IP addresses/prefix allocated to the IAB-node and the corresponding DL BAP Routing IDs.

The IAB-node should be able to send the abovementioned UL RRC messages at any time after network integration.

The IAB-MT may need to first obtain OAM configuration (including the IP addresses and/or prefixes) via PDU session or PDN connection.

For EN-DC, OAM connectivity may be obtained via LTE or via NR.

IP addresses are updated via DL RRC signaling, where the updated address replaces the old one.

RAN3 has sent an LS [1] to RAN2 for including the above information into RRC messages for IAB IP address allocation. The rapporteur understands that this issue is related to “Issue IAB\_4” and once RAN2 agrees on the type of message for IP address allocation the above RAN3 information will be included in the ASN.1 signaling for the agreed message. Still, the rapporteur would like to ask other companies about their viewpoint on this issue.

**Question 5: Do companies agree that the RAN3 information for IP address allocation will be included in the ASN.1 of the agreed RRC message and no further RAN2 discussion is required?**

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| **Company** | **Yes/No** | **Comments** |
| QC | Yes | There should only be one message used for all UL IP address related signaling (i.e. request or report). |
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**Summary**:

## Issue IAB\_6 (IAB topology discovery)

RAN3-107bis-e discussed the topology discovery in IAB donor CU for the case that IAB node obtain IP address from OAM or IAB-donor-CU, and consider the IPsec tunnel, leading to the following agreement:

**The IAB-donor-CU discovers collocation of IAB-MT and IAB-DU from the IP address used by the IAB-DU for F1-C, this may requires that the IAB-MT includes the collocated IAB-DU’s IP address(es) in uplink RRC message (e.g., RRCReconfigurationComplete message) before IAB-DU sending the first F1-C message**.

RAN3 has sent an LS [2] to RAN2 for considering the above agreement and design the RRC signaling to support the topology discovery in IAB donor CU. The rapporteur understands that this issue is related to ASN.1 signaling and will be addressed in the RRC CR without any RAN2 stage 2 discussion. The rapporteur would like to ask other companies about their viewpoint on this issue.

**Question 6: Do companies agree that no further RAN2 discussion is needed for the above RAN3 agreement?**

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| **Company** | **Yes/No** | **Comments** |
| QC | Yes | No further discussion is needed. Note that this signaling is the SAME as discussed under Q5. |
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# Other issues

## Issue IAB\_7 (Set-up at least one DRB)

RRC mandates the network to configure an RRC Connection with at least one DRB. During the RAN2 discussions, companies suggested discussing this after the MT capability discussion is over. While the rapporteur does not have an issue doing so, RAN2 needs to notice that the MT capability discussion is partly independent of this discussion. This discussion is about requiring a certain network configuration to be applied to consider the RRC Connection as valid. In other words, even if the MT is mandated to support DRBs, the NW might not configure any DRB. It is the NW’s decision.

In order to facilitate the discussion in the next meeting, the rapporteur invites companies to provide their technical arguments to (not) support mandating the network to set up a DRB to consider the RRC Connection as valid. It has been argued by some companies that there could be impacts in other groups. It is a good opportunity to elaborate on these claims, for instance.

**Question 7: Companies are asked to provide technical arguments regarding the requirement that mandates the network to configure at least one DRB, or no requirement is needed.**

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| **Company** | **Comments** |
| QC | In our opinion, no requirement is needed. However, this should be discussed under Post109bis-e][925][IAB] UE Cap (Nokia). |
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## Issue IAB\_8 (Other open issues)

Besides the issues discussed in previous sections, companies are invited to list other open issues related to the endorsed IAB RRC CR (R2-2004287).

**Question 8: Any other open issues related to the IAB RRC CR?**

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| **Company** | **Comments** |
| QC | RAN3 agreed on F1-C over LTE in last meeting:  **When an LTE leg is configured, it can be used for F1-C. It is out of RAN3 scope to design how to perform the configuration.**  **It is up to Donor-CU to decide to only configure LTE leg, or only configure NR leg, or configure both LTE leg and NR leg, for F1-C.**  **When both LTE leg and NR leg are configured, it is up to node implementation to select a leg for F1-C transfer.**  How does the donor-DU configure the IAB-node to use (1) only LTE leg, or (2) only NR leg or (3) both LTE and NR leg? This needs to occur via NR RRC since it is the prerequisite for the establishment of F1-C. We need to capture this in NR RRC signaling, e.g., it could be included in the NR RRC configuration carried in the SgNB Addition Request Ack message. In (1) or (3) is supported, the IAB-node could establish F1-C right away via LTE. |
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# Summary

Based on the inputs received from companies regards the open issues, it has been agreed:

# References

1. R3-202926, RRC Message Design for IAB IP Address Allocation, RAN3#107bis-e, Electronic Meeting, April 20th – 30th 2020.
2. R3-202851, RRC Message Design for IAB IP Address Allocation, RAN3#107bis-e, Electronic Meeting, April 20th – 30th 2020.