3GPP TSG-RAN WG2 #109-e R2- 200xxx

**Online, February 24th– March 6th 2020**

Agenda Item: 6.1.5.2

Source: Ericsson (rapporteur)

Title: Summary of 6.1.5.2: IAB Configuration except IP address

Document for: Discussion, Decision

# 1 Introduction

This document provides a summary of tdocs (except the ones related to IP address) for agenda item 6.1.5.2 of RAN2#109-e. Specifically, the document summarizes the tdocs for the IAB-MT features list.

For other topics, i.e., RRC states for IAB-MT and parent selection at IAB node, only one company provided contribution are listed in section 2.2.

# 2 Discussion

## 2.1 Rel-16 IAB-MT Layer-2 Features list

The summary in this section has considered the documents [2-4]. The IAB-MT layer-2 features list for Rel-16 was part of the email discussion [1] and based on the feedback the rapporteur suggested companies to submit contributions for RAN2#109-e, elaborating their viewpoint. The tdocs [2-4] further discuss some of the open issues covered in the email discussion [1].

To facilitate the discussion, the topic is split into two sections:

### 2.1.1 IAB-MT capabilities

#### DRB handling

During the email discussion [108#46], one company raised that 1) RRC mandates to have at least one DRB to be able to trigger certain RRC procedures. Another company [3] argues that 2) DRB handling should be mandatory to avoid, potentially, interoperability issues and imposing a certain way of designing and implementing the OAM system.

These are two different issues in the sense that the first one implies the IAB-MT must always have a DRB configured to trigger certain procedures, which might not always be the case. The second issue is related to interoperability and flexibility to design the network.

Considering all the feedback from companies collected in [1] and the input in the contributions [3,4], it is suggested that RAN2 confirms the following two observations:

1. The IAB-DU/CU allows (but not required) configuring at least one DRB for OAM purposes (as agreed by RAN3).
2. The IAB-DU/CU configures the necessary SRBs and at least one BH RLC channel towards the IAB-MT.

If RAN2 agrees on these observations, then their implications are captured in the following proposals:

1. IAB-MT should be able to handle, at most, one DRB for OAM purposes as agreed by RAN3, and implement the DRB-related functionality in PDCP to support this.

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| Company | Comments |
| AT&T | We propose to change the wording to say “at least” instead of “at most”. The way it is currently worded, allows an IAB-MT to not support any DRBs and also prevents an IAB-MT from handling more than one DRB. |
| Huawei, Hisilicon | As also commented in the email discussion, we don’t see a need to differentiate IAB-MT with UE in terms of the supported DRB number. Moreover, there is a common understanding in RAN3 that OAM traffic may also need multiple DRBs. |

1. For IAB-MTs, a configuration with SRB2 without BH RLC Channels, or with BH RLC channels without SRB2 is not supported. A configuration without DRB is supported.

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| Company | Comments |
| AT&T | Disagree with last sentence of Proposal 2. Suggest removing that part. Per our comment in response to Proposal 1, an IAB-MT must support DRB functionality. |
| Huawei, Hisilicon | We are also not sure this proposal is needed. We can reuse the legacy procedure in RRC as much as possible. A DRB has to be configured when executing HO/RRC-reestablishment, which is relevant with the RAN-CN procedures for HO/RRC-reestablishment. |

#### IP assignment over RRC

Considering all the feedback collected in [1] and the suggestions in [3-4], it is proposed that RAN2 agrees on:

1. No new capability is needed for “IP assignment over RRC”. “IP assignment over RRC” is part of the feature “0. BAP layer”.

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| Company | Comments |
| AT&T | Agree with the proposal. |
| Huawei, Hisilicon | Fine with the first part. Not sure about the second part. Why is IP assignment over RRC a part of the feature “0. BAP layer”? |

#### F1AP over LTE leg signalling

Considering the feedback collected in [1] along with the input in [3-4], it is proposed that RAN2 collects further input to be able to decide:

1. Discuss whether “F1AP over LTE leg signaling for EN-DC IAB-MT” is a capability, and the feature/feature group in which it needs to be added.

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| Company | Comments |
| AT&T | F1AP over LTE leg signaling for EN-DC IAB-MT should be a capability. We propose to add it to 0-0 Basic EN-DC procedures feature/feature group. |
| Huawei, Hisilicon | We also think it should be optional. |

#### Flow control

Considering all the feedback collected in [1] and the input provided in [3-4], it is proposed that RAN2 agrees on:

1. Feature “0.1 HbH flow control” has two components: BH RLC channel based and Routing ID based. These two components are separately signalled.

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| Company | Comments |
| AT&T | Agree. BH RLC channel based and Routing ID based components should be separate capabilities. |
| Huawei, Hisilicon | Agree. |

#### Other capabilities

Considering the feedback collected in [1], it is proposed that RAN2 asks for further input to decide if additional capabilities are needed:

1. Discuss whether other features are missing and whether they should be placed in the feature list.

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| Company | Comments |
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1. Agree on the features outlined in the appendix as a baseline.

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| Company | Comments |
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### 2.1.2 Mandatoriness of features

### Rel-16 IAB features

Considering the feedback collected in [1], the input provided in [2,4], and the conclusions reached in the document [5], it is proposed to agree on:

1. For an IAB-MT node:   
   - The BAP layer feature group is mandatory supported with capability signalling.  
   - All other Rel-16 features are optional.

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| Company | Comments |
| Huawei, Hisilicon | We are not sure why it needs to be with capability signaling. The BAP feature group should be conditional mandatory, i.e. mandatory for all IAB-MTs. |

### Rel-15 IAB features

Considering the feedback collected in [1] and the input provided in [3-4], it is proposed to agree/discuss the following way forward:

1. The following Rel-15 mandatory features will remain mandatory for Rel-16 IAB-MTs:  
   - Feature 0-3 “DRBs”   
   - Feature 1-0 “Basic PDCP procedures”  
   (A note might be needed to clarify the scope of the features for IAB depending on the outcome in P1).

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| Company | Comments |
| Huawei, Hisilicon | We prefer to not discuss Rel-15 capabilities; otherwise, we may need to discuss one by one if they are needed for IAB. |

1. The following Rel-15 mandatory features become optional for Rel-16 IAB-MTs:   
   - Feature 0-0 “Basic EN-DC procedures”, 2) “SCG DRB with NR PDCP”   
   - Feature 3-3 “DRX”  
   - Feature 4-5 “ANR”  
   - Feature 5 “SDAP”  
   - Feature 6 “Inactive”

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| Company | Comments |
| AT&T | We prefer to leave Feature 4-5 “ANR” as mandatory to allow the use of ANR feature for easier/quicker topology modification and optimization. Especially when the deployed IAB network is growing or being modified, the ANR feature is very useful even for fixed IAB nodes. |
| Huawei, Hisilicon | We prefer to not discuss Rel-15 capabilities; otherwise, we may need to discuss one by one if they are needed for IAB. |

1. All other Rel-15 L2-3 features remain as they are for Rel-16 IAB-MTs.

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## 2.2 Other topics for agenda item 6.1.5.2

The topics listed in this section are raised by only one company, and since there is not enough input, no summary is provided.

* RRC state of IAB nodes [6].
* Parent selection at IAB nodes during initial setup [7].

However, [6] raised some open issues related to RRC signalling for IAB-MT, which need further discussion in RAN2.

1. Topics in “2.2 other topics” require further discussion.

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| Company | Comments |
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# 4 Conclusion

In this summary…

# 5 References

1. R2-2000740, Email discussion[108#46][IAB] Feature list. Ericsson
2. R2-2000819, On BAP features and their mandatory vs. optional support. Samsung Electronics GmbH
3. R2-2001061, IAB-MT features list and capabilities. Nokia, Nokia Shanghai Bell
4. R2-2000754, IAB-MT feature capabilities. Ericsson
5. R2-1916192, Work plan for Rel-16 UE Capability feature list. Intel.
6. R2-2000895 Views on RRC states of IAB nodes. CATT
7. R2-2000469 Parent selection at IAB nodes during initial setup. Intel Corporation

Appendix:

Layer-2 and Layer-3 features

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| **Features** | **Index** | **Feature group** | **Components** | **Prerequisite feature groups** | **Field name in TS 38.331 [2]** | **Parent IE in TS 38.331 [2]** | **Need of FDD/TDD differentiation** | **Need of FR1/FR2 differentiation** | **Note** | **Mandatory/Optional** |
| 0. BAP Layer | 0.0 | Basic procedures | 1) Routing  2) Bearer mapping  3) IP assignment over RRC |  |  |  |  |  |  |  |
|  | 0.1 | HbH flow control | 1) BH RLC channel based  2) Routing ID based |  |  |  |  |  |  |  |
|  | 0.2 | RLF handling |  |  |  |  |  |  |  |  |
| 1. PDCP | 1.0 |  |  |  |  |  |  |  |  |  |
| 2. RLC | 2.0 |  |  |  |  |  |  |  |  |  |
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| 3. MAC | 3.0 | Scheduling | Pre-BSR |  |  |  |  |  |  |  |
|  | 3.1 | Bearer mapping | LCID extension |  |  |  |  |  |  |  |