3GPP TSG-RAN WG3 #117-e R3-224992

Online, Aug 17 – 25, 2022

Agenda Item: 9.2.5

Source: Qualcomm (Moderator)

Title: Summary of CB: #9\_Rel-17IAB

Document for: Discussion

# Introduction

This paper handled the following CB discussion:

|  |
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| **CB: # 9\_R17IAB****- Check the details of miscellaneous corrections on R17 IAB****- Provide CRs if agreeable**(Qualcomm - moderator)Summary of offline disc [R3-224992](file:///C%3A%5Ctemporary%5CRAN3%5CRAN3%20August%2022%5CCB%20sessions%5CCB%209%20Rel17%20IAB%5CInbox%5CR3-224992.zip) |

The following papers will be covered as assigned by the chair:

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| [R3-224209](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117-e%5CDocs%5CR3-224209.zip) | LS on upper layers parameters for Rel-17 eIAB (RAN1) | LS in |
| [R3-224349](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117-e%5CDocs%5CR3-224349.zip) | Correction on IAB Multiplexing info (Huawei, Lenovo, Ericsson, Samsung) | CR0980r, TS 38.473 v16.10.0, Rel-16, Cat. F |
| [R3-224350](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117-e%5CDocs%5CR3-224350.zip) | Miscellaneous Correction on IAB (Huawei, Qualcomm, Ericsson) | CR0981r, TS 38.473 v17.1.0, Rel-17, Cat. F |
| [R3-224351](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117-e%5CDocs%5CR3-224351.zip) | Miscellaneous Correction on IAB (Huawei, Qualcomm, Lenovo, Fujitsu, Ericsson ) | CR0860r, TS 38.423 v17.1.0, Rel-17, Cat. F |
| [R3-224352](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117-e%5CDocs%5CR3-224352.zip) | Correction on protocol stack for IAB (Huawei, Qualcomm, Lenovo, Fujitsu, Ericsson ) | CR0242r, TS 38.401 v17.1.1, Rel-17, Cat. F |
| [R3-224500](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117-e%5CDocs%5CR3-224500.zip) | (CR TS 38.423) Correction to RB Set Definition (Ericsson) | CR0870r, TS 38.423 v17.1.0, Rel-17, Cat. F |
| [R3-224501](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117-e%5CDocs%5CR3-224501.zip) | (CR TS 38.473) Correction to RB Set Definition (Ericsson) | CR0987r, TS 38.473 v17.1.0, Rel-17, Cat. F |
| [R3-224503](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117-e%5CDocs%5CR3-224503.zip) | CR for 38.473 on Rel-17 IAB enhancements to topology adapatation (Qualcomm Inc.) | CR0246r, TS 38.401 v17.1.1, Rel-17, Cat. F |
| [R3-224703](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117-e%5CDocs%5CR3-224703.zip) | Corrections on IAB inter-CU topology adaptation (Fujitsu) | CR0250r, TS 38.401 v17.1.1, Rel-17, Cat. F |
| [R3-224715](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117-e%5CDocs%5CR3-224715.zip) | Miscellaneous corrections on IAB in TS 38.473 (ZTE) | CR1008r, TS 38.473 v17.1.0, Rel-17, Cat. F |
| [R3-224735](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117-e%5CDocs%5CR3-224735.zip) | Correction to 38.420 for IAB (CATT) | CR0032r, TS 38.420 v17.1.0, Rel-17, Cat. F |

**Phase I**：Converge on the CRs. Please give your feedback before Thursday, 18th August, 2022, 23:59 UTC.

**Phase II**：If further discussion is needed.

# For the Chairman’s Notes

**Proposal 2: Agree CR0980r to TS 38.473 in R3-224349**

**Proposal 3: Agree CR0981r to TS 38.473 in R3-224350 with the following revision: Insert “, and if the migrating IAB-node has one or more routing entries for the target path” after “If the gNB-DU belongs to a migrating IAB-node, whose co-located IAB-MT has successfully performed RLF recovery after handover failure”**

**Proposal 4: Agree CR0860r to TS 38.423 in R3-224351**

**Proposal 5: Agree CR0242r to TS 38.401 in R3-224352**

**Proposal 6: Agree CR-246r to TS 38.401 in R3-224503 with the following revision:**

**1: Replace “should” with “may” in the second change.**

**2: Replace “..the source IAB-donor-CU reconfigures…” with “..the source IAB-donor-CU may reconfigure…” in the third change.**

**3: Replace “descendent node” with “descendant node” in all changes.**

**Proposal 7: Agree CR-250r to TS 38.401 in R3-224703 with the following revision:**

**1: Remove “for UL F1-C/non-F1 traffic” in the change in step 6.**

**2: Replace the wording of the new step 10 with the following wording: “10. If needed, the source IAB-donor-CU configures UL BH mappings on the descendent node and BAP-sublayer routing entries between the descendant node and the migrating IAB-node. This step may be performed at an earlier stage, e.g., immediately after step 4.”**

**3: Replace “8.17.2.1” in step 0 in figure 8.17.3.2-1** **with “8.17.3.1”.**

**Proposal 8: Agree change 1 of CR-1008r to TS 38.473 in R3-224715, i.e., clarification that “the lowest index of RB of the IAB-DU cell” in the description of Number of RB Sets IE should be the lowest index of RB of the carrier indicated by the Subcarrier Spacing IE.**

# Discussion-Phase I

## LS from RAN1: R3-224209

LS from RAN1:

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| [R3-224209](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117-e%5CDocs%5CR3-224209.zip) | LS on upper layers parameters for Rel-17 eIAB (RAN1) | LS in |

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| Title: LS on upper layers parameters for Rel-17 eIABResponse to: -Release: Rel-17Work Item: NR\_IAB\_enh-CoreSource: RAN WG1To: RAN WG2, RAN WG3Cc:1. **Overall Description:**

RAN1 has made the following agreements in RAN1#109e related to RRC parameters for Rel-17 eIAB:

|  |
| --- |
| AgreementAn IAB node can be configured with two availabilityCombinations tables, one for TDM and one for FDM**Agreement**If an IAB node is configured with two availabilityCombinations tables, both shared and separate AI index fields are supported by introducing positioninDCI-AI-rel17. |

In addition, RAN1 has made the following agreements in RAN1#109e related to F1AP parameters for Rel-17 eIAB:

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| **Agreement**If the RB sets of a Rel-17 IAB-DU H/S/NA resource configuration do not cover the entire carrier bandwidth: The remaining RBs not part of an RB set configuration are considered as included in the last RB set. |

**2. Actions:****To RAN WG2 and RAN WG3****ACTION:** RAN1 would like to kindly ask RAN2 and RAN3 to consider the design of the corresponding higher-layer parameters in Rel-17.  |

The first two agreements affect RRC and need to be handled by RAN2. The third agreement has been addressed by CRs R3-224350, R3-224351, R3-224500, and R3-224501 and will be discussed further below.

## 3.2 Rel-16 CR to 38.473 on IAB Multiplexing info

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| [R3-224349](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117-e%5CDocs%5CR3-224349.zip) | Correction on IAB Multiplexing info (Huawei, Lenovo, Ericsson, Samsung) | CR0980r, TS 38.473 v16.10.0, Rel-16, Cat. F |
| ***Reason for change:*** | * In section 9.3.1.108, the order of the *DU\_RX/MT\_TX* IE and *DU\_TX/MT\_RX* IE in the tabular is not align with ASN.1 part.
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|  |  |
| ***Summary of change:*** | 1. In section 9.3.1.108, change the order of the *DU\_RX/MT\_TX* IE and *DU\_TX/MT\_RX* IE

**Impact analysis**Impact assessment towards the previous version of the specification (same release): This CR has isolated impact with the previous version of the specification (same release).This CR has no impact under functional point of view. The impact can be considered isolated because the change affects only the IAB related procedure.The changes are backward compatible. |

**Q2: Do you support this CR to 38.473 proposed by** [R3-224349](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117-e%5CDocs%5CR3-224349.zip)**?**

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| **Company** | **Yes/No** | **Comments if any** |
| Qualcomm | Yes |  |
| Huawei | Yes |  |
| Nokia | Yes |  |
| **Ericsson** | **Yes** |  |
| ZTE | **Yes** |  |
| Fujitsu | Yes |  |
| Samsung | Yes |  |

**Summary:** Full support

**Proposal 2: Agree CR0980r to TS 38.473 in R3-224349**

## 3.3 Rel-17 Misc CRs to 38.473 on IAB

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| [R3-224350](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117-e%5CDocs%5CR3-224350.zip) | Miscellaneous Correction on IAB (Huawei, Qualcomm, Ericsson) | CR0981r, TS 38.473 v17.1.0, Rel-17, Cat. F |

The change number 8 below is also captured in:

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| [R3-224501](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117-e%5CDocs%5CR3-224501.zip) | (CR TS 38.473) Correction to RB Set Definition (Ericsson) | CR0987r, TS 38.473 v17.1.0, Rel-17, Cat. F |

R3-224501 will therefore be discussed together with R3-224350.

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| ***Reason for change:*** | * RAN3-114bis has the following working assumption: “WA: Upon migration/HO failure case, the buffered RRC message is still transferred to child node”. And RAN2-117e agreed that “RAN2 does not have specific concerns about RAN3’s WA that upon migration/HO failure, the buffered RRC message is still transferred to the child node.” After HO failure, the migrating IAB-MT will perform RLF recovery by initiating RRCReestablishment,
* If the recovery fails, the migrating IAB-node will send BH RLF notification to its child node, and then the child node will perform RLF recovery. In this case, it doesn’t matter whether the buffered RRCReconfiguration message is released to the child node or not.
* If the recovery is successful, the migrating IAB-node should release the buffered RRCReconfiguration message to the child node. This is to let the child node perform reconfiguration of IP address and default BAP configuration in the target path if the migrating IAB-node connects to the target partent node after successful recovery, or to avoid the PDCP SN gap with the subsequent RRCReconfiguration if the migrating IAB-node connects to a different target parent node.

Therefore, the condition that the migrating IAB-node has successfully recovered after handover failure should also be captured in the UE context modification procedure.* The sentence “for each parent-node cell serving an IAB-node indicated by the *gNB-CU UE F1AP ID* IE and the *gNB-DU UE F1AP ID* IE” in the paragraph of about the *Neighbour-Node Cells List* is confusing. It reads like the gNB-DU will only store the peer parent node information. However, other neighbour cells which are not the peer parent node should also be take into account for the interference mitigation.
* The Buffer size threshold for determining the congestion in clause 9.2.9.1 is in bytes, it does not match the unit for available buffer size defined in BAP specification TS38.340.
* In the neighboring-node cells list IE, the information of peer parent node’s cell should cover both intra-CU DC and inter-CU DC scenario, as described in RAN1 LS (R3-222799), but the semantics description for the peer-parent node indicator only mention the “boundary IAB-node”, so the intra-CU dual connectivity case is not included.
* In section 9.2.9.3, the constant maxnoofServingCells is used in *Serving Cells List* IE but not defied in the range bound table.
* In clause 9.3.1.107, the RB set index is not extendable in the table, not aligh with the ASN.1 part.
* RAN1 send LS R1-2205644, to notify the new agreements in RAN1 #109e : If the RB sets of a Rel-17 IAB-DU H/S/NA resource configuration do not cover the entire carrier bandwidth: The remaining RBs not part of an RB set configuration are considered as included in the last RB set. This agreement needs to be captured in the RB set configuration.
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| ***Summary of change:*** | 1. In section 8.3.4.2, add “migrating IAB-MT has successfully performed RLF recovery after handover failure” as new condition for the gNB-DU to release the buffered RRCReconfiguration towards the child node. And made some editorial changes to the other conditions.
2. In clause 8.10.2.2, remove the confusing sentence “for each parent-node cell serving an IAB-node indicated by the *gNB-CU UE F1AP ID* IE and the *gNB-DU UE F1AP ID* IE”. And clarify how to interpret the UE F1AP IDs as well as the Peer Parent-Node Indicator which is also optional IE in the message.
3. Change the bytes to kilobytes in the semantics description for the Buffer Size Threshold in clause 9.2.9.1.
4. In section 9.2.9.3, change the “boundary IAB-node” as “dual connected IAB-node” in the semantics description of the “Peer Parent-Node Indicator”.
5. In section 9.2.9.3, add the Maxnoofservingcells in the range bound table.
6. In clause 9.3.1.107, change the RB set index to be extendable.
7. In 9.3.1.230, capture the following agreements in the semantics description of RB set size IE: If the RB sets of a Rel-17 IAB-DU H/S/NA resource configuration do not cover the entire carrier bandwidth: The remaining RBs not part of an RB set configuration are considered as included in the last RB set. This agreements needs to be captured in the RB set configuration.
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**Q3: Do you support the CRs to 38.473 proposed by** [R3-224350](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117-e%5CDocs%5CR3-224350.zip)**?**

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| **Company** | **Yes/No** | **Comments if any** |
| Qualcomm | Yes |  |
| Huawei | Yes |  |
| Nokia | Yes with comments | For the 1st change, please add “if the migrating IAB-node has one or more routing entries for the target path.” This should be similar to the 1st bullet (HO case) |
| **Ericsson** | **Yes** |  |
| ZTE | Yes  | Agree with nokia’s comment.  |
| Fujitsu | Yes, except for the first change | We understand the point of the first change, but we think it may not be proper to mention HO failure or HO success in 38.473. The condition of delivering the buffered RRCReconfiguration message for the IAB-MT HO success case has already been captured in 38.473:“If the gNB-DU belongs to a migrating IAB-node, whose co-located IAB-MT has successfully performed the random-access procedure to the target parent node, and where the migrating IAB-node has one or more routing entries for the target path.”Considering “IAB-MT has successfully performed the random-access procedure” and “the migrating IAB-node having at least one routing entry” are exactly necessary for delivering the RRC message to descendant nodes in case of IAB-MT HO failure and RLF recovery, a unified condition for both HO success case and HO failure case can be made. We think following text can be considered as the unified condition: “If the gNB-DU belongs to a migrating IAB-node, whose co-located IAB-MT has successfully performed the random-access procedure to the new parent node corresponding to the last RRC message to the co-located IAB-MT for the intra-donor configuration, and where the migrating IAB-node has one or more routing entries for the new path of the intra-donor migration. |
| Samsung | Yes |  |

**Summary:**

All companies support the CR in R3-224350.

Two companies wish to insert “, and if the migrating IAB-node has one or more routing entries for the target path.” after “If the gNB-DU belongs to a migrating IAB-node, whose co-located IAB-MT has successfully performed RLF recovery after handover failure.” This better aligns the RLF recovery scenario with the successful HO scenario. The moderator agrees.

One company proposes to merge the successful HO scenario and the RLF recovery scenario into one common statement. The moderator believes that this does not change the content of the original CR together with the addition. At the same time, the merged sentence becomes rather long and hard to understand. For that reason, the moderator proposes to keep with the original CR together with the addition related to the routing entries.

**Proposal 3: Agree CR0981r to TS 38.473 in R3-224350 with the following revision: Insert “, and if the migrating IAB-node has one or more routing entries for the target path” after “If the gNB-DU belongs to a migrating IAB-node, whose co-located IAB-MT has successfully performed RLF recovery after handover failure”**

## 3.4 Rel-17 Misc CRs to 38.423 on IAB

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| [R3-224351](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117-e%5CDocs%5CR3-224351.zip) | Miscellaneous Correction on IAB (Huawei, Qualcomm, Lenovo, Fujitsu, Ericsson ) | CR0860r, TS 38.423 v17.1.0, Rel-17, Cat. F |

The change number 6 below is also captured in:

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| [R3-224500](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117-e%5CDocs%5CR3-224500.zip) | (CR TS 38.423) Correction to RB Set Definition (Ericsson) | CR0870r, TS 38.423 v17.1.0, Rel-17, Cat. F |

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| ***Reason for change:*** | * In section 8.5.4.2, “The non-F1-terminating/F1-terminating IAB-donor-CU may respond with the IAB RESOURCE COORDINATION RESPONSE message to the F1-terminating/non-F1-terminating IAB-donor-CU”. The “may respond” is not suitable since the procedure is a class 1 procedure and the response message is necessary.
* Inconsistence of terminology : the term “F1-terminating IAB-donor-CU” and “non-F1-terminating IAB-donor-CU” are use in some places, but in the procedure description and the figures of the procedures, we use “F1-termianting IAB-donor” and “non-F1 termianting IAB-donor” instead. And the “IAB-donor” is more appropriate than the “IAB-donor-CU” in this XnAP specification.
* In section 9.1.4.3, the IE “cause” refers to a wrong clause.
* In section 9.2.2.83, the IE name “Ingress BH RLC CH” should be “Ingress BH RLC CH ID”
* In section 9.2.2.95, the value range for the IE “RB Set Index” is start from 1, not align with the semantic description and the F1AP specification.
* RAN1 send LS R1-2205644, to notify the new agreements in RAN1 #109e : If the RB sets of a Rel-17 IAB-DU H/S/NA resource configuration do not cover the entire carrier bandwidth: The remaining RBs not part of an RB set configuration are considered as included in the last RB set. This agreements needs to be captured in the RB set configuration.
* In clause 9.2.2.97, the following constant: maxnoofRBsetsPerCell1, maxnoofPhysicalResourceBlocks, maxnoofPhysicalResourceBlocks1 are not used in the IE tabular, so the three constants are not necessary in the range bound table.
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| ***Summary of change:*** | 1. In section 8.5.4.2, use “shall” instead of “may” in the sentence “The non-F1-terminating/F1-terminating IAB-donor-CU may respond with the IAB RESOURCE COORDINATION RESPONSE message to the F1-terminating/non-F1-terminating IAB-donor-CU”.
2. Replace the “IAB-donor-CU” by “IAB-donor” in the term “F1-terminating IAB-donor-CU” and “non-F1-terminating IAB-donor-CU” across the whole specification.
3. In section 9.1.4.3, change the IE “cause” reference to 9.2.3.2.
4. In section 9.2.2.83, change the IE name “Ingress BH RLC CH” to “Ingress BH RLC CH ID”.
5. In section 9.2.2.95, the value range for the IE “RB Set Index” in the IE type and reference part is changed as INTEGER (0.. *maxnoofRBsetsPerCell1,…*), to align with the semantic description and the F1AP specification. And update the ASN.1 part in 9.3.5 accordingly.
6. Capture the following agreements in the semantics description of RB set size IE: If the RB sets of a Rel-17 IAB-DU H/S/NA resource configuration do not cover the entire carrier bandwidth: The remaining RBs not part of an RB set configuration are considered as included in the last RB set. This agreements needs to be captured in the RB set configuration.
7. In clause 9.2.2.97, remove following constants from the range bound table: maxnoofRBsetsPerCell1, maxnoofPhysicalResourceBlocks, maxnoofPhysicalResourceBlocks1.

**Impact analysis**Impact assessment towards the previous version of the specification (same release): This CR has isolated impact with the previous version of the specification (same release).This CR has no impact under functional point of view. The impact can be considered isolated because the change affects only the IAB related procedure.The changes are backward compatible. |

**Q4: Do you support the CRs to 38.423 proposed by** [R3-224351](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117-e%5CDocs%5CR3-224350.zip)**?**

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| --- | --- | --- |
| **Company** | **Yes/No** | **Comments if any** |
| Qualcomm | Yes |  |
| Huawei | Yes |  |
| Nokia  | Yes |  |
| **Ericsson** | **Yes** |  |
| ZTE | **Yes** |  |
| Fujitsu | Yes |  |
| Samsung | Yes |  |

**Summary:** Full support

**Proposal 4: Agree CR0860r to TS 38.423 in R3-224351**

## 3.5 Rel-17 CR to 38.401 on IAB protocol stack

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| [R3-224352](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117-e%5CDocs%5CR3-224352.zip) | Correction on protocol stack for IAB (Huawei, Qualcomm, Lenovo, Fujitsu, Ericsson ) | CR0242r, TS 38.401 v17.1.1, Rel-17, Cat. F |

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| ***Reason for change:*** | 1. In section 6.1.4, for the protocol stack related to CP-UP separation scenario 1 shown in Fig. 6.1.4-4, the RRC layer should be terminated at the MgNB, since the F1-C related message is transmitted from MgNB to SgNB via the “F1-C traffic transfer” procedure.
2. In Fig. 6.1.4-5, there is typo (redundant wording “RRC”) for the NR RRC layer shown in the IAB-donor-CU-CP side.
3. In section 8.12.1, for the Note in which the NR-DC is established before the F1-C setup, if MN decides that the SN is the F1-terminating donor, it notifies the SN via the SN addition request, rather than in Phase 2.1 and 2.2 given in the bracket, which is confusing and unnecessary.
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| ***Summary of change:*** | 1. Correct the protocol stack in Fig. 6.1.4-4.
2. Remove the redundant “RRC” from the IAB-donor-CU-CP in Fig. 6.1.4-5
3. Delete the content “(Phase 2.1 and 2.2)” in section 8.12.1.

**Impact analysis**Impact assessment towards the previous version of the specification (same release): This CR has isolated impact with the previous version of the specification (same release).This CR has no impact under functional point of view. The impact can be considered isolated because the change affects only the IAB related procedure.The changes are backward compatible. |

**Q5: Do you support the CRs to 38.401 proposed by** [R3-224352](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117-e%5CDocs%5CR3-224350.zip)**?**

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| --- | --- | --- |
| **Company** | **Yes/No** | **Comments if any** |
| Qualcomm | Yes |  |
| Huawei | Yes |  |
| Nokia | Yes |  |
| **Ericsson** | **Yes** |  |
| ZTE | **Yes** |  |
| Fujitsu | Yes |  |
| Samsung | Yes |  |

**Summary:** Full support

**Proposal 5: Agree CR0242r to TS 38.401 in R3-224352**

## 3.6 First Rel-17 CR to 38.401 on IAB topology adaptation

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| [R3-224503](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117-e%5CDocs%5CR3-224503.zip) | CR for 38.401 on Rel-17 IAB enhancements to topology adapatation (Qualcomm Inc.) | CR0246r, TS 38.401 v17.1.1, Rel-17, Cat. F |

This CR includes the issue captured by the chair in last RAN3 meeting:

*Updates to stage2 for Alt1 to avoid the packet discarding due to no matched routing entries during parallel TNL migration of the descendant nodes in IAB intra-CU topology adaptation? LS to RAN2?*

|  |  |
| --- | --- |
| ***Reason for change:*** | **1:** For intra-donor topology adaptation in section 8.2.3, the present text specified:If needed, the IAB-donor-CU configures BH RLC channels, BAP-sublayer routing entries on the target path for the descendant nodes and the BH RLC channel mappings on the descendant nodes in the same manner as described for the migrating IAB-node in step 11. The yellow highlighted text is technically correct, but it omits that the BH RLC channel mappings may also have to be updated on the migrating IAb-node. **2:** For intra-donor topology adaptation in section 8.2.3, RAN3#116 identified the following issue:*Updates to stage2 for Alt1 to avoid the packet discarding due to no matched routing entries during parallel TNL migration of the descendant nodes in IAB intra-CU topology adaptation? LS to RAN2*The present text already specified that for parrellel TNL migration of the descendent nodes, the RRCReconfiguration messages with the new TNL address(es) and the new default BAP configuration needs to be sent to the descendent node while the migrating IAB-MT is still connected with the source parent node. It misses that the BAP-sublayer routing entries on the migrating IAB-node and the descendent nodes also need to be reconfigured while the migrating IAB-MT is still connected with source parent node. **3.** For inter-donor topology adaptation of the descendent nodes in section 8.17.3.2, the following section:The target IAB-donor-CU may trigger the modification of the L2 transport of the offloaded traffic in the target IAB-donor-CU’s topology. The target IAB-donor-CU may further provide updated TNL address information for the descendant IAB-node to the source IAB-donor-CU.omits the to include the name of the XnAP message used for this trigger. It further omits that based on this message, the source IAB-donor-CU should reconfigure the UL BH mappings on the descendent nodes, the routing entries and BH RLC channel mappings on the migrating node and the descendent nodes, and the BAP header rewriting entries on the migrating node, and acknowledge the modification via the IAB TRANSPORT MIGRATION MODIFICATION RESPONSE message.  |
|  |  |
| ***Summary of change:*** | **Change 1**: For intra-donor topology adaptation in section 8.2.3, the BH RLC channel mapping reconfiguration is included with the BAP-sublayer reouting entreis reconfiguration on the target path for the descendent nodes. This inlcudes all nodes on the path, i.e., also the migrating IAB-node.**Change 2**: For intra-donor topology adaptation in section 8.2.3, it was added that the configuration of BAP-sublayer routing entries on the migrating IAB-node and the descendent nodes should also occur while the migrating IAb-MT is still connected with the source parent node.**Change 3:** For inter-donor topology adaptation of the descendent nodes in section 8.17.3.2, the XnAP message name was added. It was further added that based on this message, the source IAB-donor-CU should reconfigure the UL BH mappings on the descendent nodes, the routing entries and BH RLC channel mappings on the migrating node and the descendent nodes, and the BAP header rewriting entries on the migrating node, and acknowledge the modification via the IAB TRANSPORT MIGRATION MODIFICATION RESPONSE message. |

**Q6: Do you support the CRs to 38.401 proposed by** [R3-224503](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117-e%5CDocs%5CR3-224350.zip)**?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments if any** |
| Qualcomm | Yes |  |
| Huawei | See comment | Change 1 is ok.Change 2: we prefer to use “may” instead of “should” since the pre-configuration is not mandatory.Change 3: Even if the target donor changes the non-F1 terminating BH information, the UL BH mapping, routing entries, and BH RLC CH mappings on the descendant node may not need change. But the current change 3 seems mandatory the reconfiguration at the descendant nodes, but this is not appropriate. Suggest to remove the content related to descendant nodes in the new added sentences, or change the wording to make the reconfiguration to descendant nodes optional.  |
| Nokia | Yes |  |
| **Ericsson** | Yes, but see comments | Same view as Huawei for changes 2 and 3.Please use the term descendant (a noun), not descendent (which is an adjective). |
| ZTE |  | Change 1: Similar change is also needed in step 11 in section 8.2.3.1 and step 14 in section 8.17.3.1. Change 2: we have the same view with Huawei that “should” needs to be replaced by “may”. Another question is, we have not discussed pre-configuration of routing entries on the migrating IAB node. What we discussed is the pre-configuration of routing entries on the descendant IAB node. So we suggest the following change: The IAB-donor-CU may further configure the BAP-sublayer routing entries on the descendent nodes while the migrating IAB-MT is still connected with the source parent node.Change 3: agree with Huawei. |
| Fujitsu | Yes |  |
| Samsung | Yes |  |

**Summary:**

There is strong support for this CR with some recommendations for changes.

**Change 1:** Full support.

**Change 2:**

* Three companies propose to replace “should” with “may”. The moderator believes that this makes sense.
* One company believes that the pre-configuration of routing entries should only be added for the descendent nodes but not for the migrating IAB-node. The moderator believes that the pre-configuration needs to apply to the migrating IAB-node as well. Otherwise, UL traffic could not be properly routed via the target path. Also, in this case, all the pre-configuration of routing entries on the descendant nodes would be useless.

**Change 3:** Two companies believe that the sentence beginning with “Based on this message, the source IAB-donor-CU reconfigures the UL BH mappings ...” is too strongly worded. The moderator proposes softening this wording by adding “..the source IAB-donor-CU **may** configure**~~s~~**…”.

**Other comments:** One company would like see “descendent” to be replaced with “descendant”. The moderator believes that this should be doable.

**Proposal 6: Agree CR-246r to TS 38.401 in R3-224503 with the following revision:**

**1: Replace “should” with “may” in the second change.**

**2: Replace “..the source IAB-donor-CU reconfigures…” with “..the source IAB-donor-CU may reconfigure…” in the third change.**

**3: Replace “descendent node” with “descendant node” in all changes.**

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| --- | --- | --- |
| [R3-224503](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117-e%5CDocs%5CR3-224503.zip) | CR for 38.401 on Rel-17 IAB enhancements to topology adapatation (Qualcomm Inc.) | CR0246r, TS 38.401 v17.1.1, Rel-17, Cat. F |

## 3.7 Second Rel-17 CR to 38.401 on IAB topology adaptation

|  |  |  |
| --- | --- | --- |
| [R3-224703](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117-e%5CDocs%5CR3-224703.zip) | Corrections on IAB inter-CU topology adaptation (Fujitsu) | CR0250r, TS 38.401 v17.1.1, Rel-17, Cat. F |

|  |  |
| --- | --- |
| ***Reason for change:*** | In inter-CU topology adaptation procedure with descendant node, BH RLC channels, BAP-layer route entries shoud be configured on the target path for the descendant nodes and the BH RLC channel mappings on the descendant nodes. This is needed for inter-CU topology adaptation, inter-CU BH RLF recovery, and inter-CU topology redundancy with descendant node. To avoid the packet discarding due to no matched routing entries during parallel TNL migration of the descendant nodes These configurations may be performed at an earlier stage, e.g., before IAB-donor-CU sending the RRCReconfiguration message to parent node of each descendant node.The default UL mapping for descendant node should also be provided in RRCReconfiguration. |
|  |  |
| ***Summary of change:*** | 1. In step 6, add a description that the default UL mapping for descendant node my be provided via RRCReconfiguration.
2. Add a procedural step 10 for the inter-CU topology adaptation with descendant node that BH RLC channels, BAP-layer route entries shoud be configured on the target path for the descendant nodes and the BH RLC channel mappings on the descendant nodes.
3. These configurations may be performed at an earlier stage, e.g., before IAB-donor-CU sending the RRCReconfiguration message to parent node of each descendant node.
4. Update Figure 8.17.3.2-1 to reflect the added step 10.

**Impact Analysis**Impacted 5G architecture options:SA, NR-DC Impacted functionality:NR eIAB Inter-operability:1. If the IAB is implemented according to this CR but the network is not, there is no inter-operability issue foreseen.
2. If the network is implemented according to this CR but the IAB is not, there is no inter-operability issue foreseen.
 |

**Q7: Do you support the CR to 38.401 proposed by** [R3-224703](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117-e%5CDocs%5CR3-224350.zip)**?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments if any** |
| Qualcomm | Yes | This change is absolutely necessary. A little more on the motivation: It may not be necessary to change UL mapping and routing on the target path for descendent node traffic if the BAP routing ID contained in the old DN UL mappings remain unchanged. Keeping them unchanged implies that the BAP address in this BAP routing ID of the old UL mappings, which is the BAP address of the old donor-DU, become the “pseudo” BAP address for the new donor-DU. Choosing the BAP address of the old donor-DU as the “pseudo” BAP address for the new donor-DU **is not possible** if the DN is dual-connected and has another path to the old donor-DU. In this case, it is configured with IP addresses from the old and the new donor-DUs, and the BAP addresses for these two sets of IP addresses must be different, so that the DN can select the UL mapping for an UL packet in compliance with source IP address of that packet.  |
| Huawei | See comment | Change in step 6 is OK.For change in step 10, is the parallel TNL migration also supported for the inter-donor migration case? And the BH RLC channel, routing entry and mapping may not need to be updated for descendant nodes since the link for the descendant nodes does not changed. |
| **Nokia** |  | For change to Step 6, please delete “for UL F1-C/non-F1 traffic” (since BAP spec is clear on how to use the default thing), or change it to “for UL non-F1-U traffic”For change to “new” Step 10, for the 1st sentence, it is different to Step 2 since Step 2 configures the BH RLC CHs on the target path. In this step, source CU only configure the descendant IAB. Suggest change to “If needed, the source IAB-donor-CU configures the descendant nodes about the BH RLC channels, BAP-sublayer routing entries and the BH RLC channel mappings related to the target path.”. For the 2nd sentence, parallel TNL migration is for intra-CU migration. Please delete “To enable parallel TNL migration of the descendant nodes,”BTW, Please add one correction for Step 0 in the figure, it should be “8.17.3.1” rather “8.17.2.1” |
| **Ericsson** | With rewording | We support Nokia’s comments. |
|  |  | Agree with the change to step 6For the change to step 10, BH RLC channel mappings is also needed to be configured on the target path for the descendant node. And parallel TNL migration was discussed in intra-donor migration scenario only. So we suggest the following change:10. If needed, the source IAB-donor-CU configures BH RLC channels, BH RLC channel mappings and BAP-sublayer routing entries on the target path for the descendant nodes in the same manner as described for the migrating IAB-node in step 2.  |
| Fujitsu | Yes | To HW’s comment: It is true that parallel TNL migration is not discussed for inter-donor migration. However, the new step 10 can be done at an earlier stage by implementation. We may adopt Nokia’s suggestion to delete “To enable parallel TNL migration of the descendant nodes,”.The new step 10 has “if needed” in the sentence so it is optional in some scenarios. In scenarios that the source donor-CU configures new routing entries/BH RLC channels for the target/new/redundant path of a descendent node, it needs to (re-)configure the descendent nodes along the target path. |

**Summary:**

There is strong support for this CR with some recommendations for changes.

**Change in Step 6:** All companies support this change. Two companies believe that “for UL F1-C/non-F1 traffic” is not needed in this change since it is well explained in the BAP spec. The moderator agrees.

**New Step 10: The following issues are raised:**

* The new step 10 refers to “in the same manner as described for the migrating IAB-node in step 2”. One company believes that this is incorrect since step 2 refers to the target path between boundary node and target donor-DU while the new step refers to the section between DN and boundary node. The moderator agrees and proposes to reword (see below).
* The new step 10 refers includes “if needed”, which makes this step seem optional. However, this step may be mandatory under some circumstances. The moderator believes that “if needed” can never be wrong. In fact, it emphasizes that this step is not necessary if not needed, which is important.
* The new step 10 refers to “parallel TNL migration of the descendant nodes”, which some companies believe should only apply to intra-donor migration. The moderator agrees that the term “parallel migration” has only been used in the context of intra-donor migration. However, the authors of this CR want to state that “Step 10 can be conducted at an earlier stage, e.g., right after step 4”. The moderator believes that this is a correct statement and should be captured in as such (see below).
* One company believes that the BH RLC channel, routing entry and mapping may not need to be updated for descendant nodes since the link for the descendant nodes does not change. The moderator agrees that the BH RLC channels indeed do not have to be updated. However, the routing entries and the UL BH mappings may have to be updated. The moderator has included this below.
* One company emphasizes that the box of step 0 in Figure 8.17.3.2-1 should refer to “8.17.3.1” rather than “8.17.2.1”. The moderator agrees.

Based on this discussion, the moderator proposes the following rewording of the new step 10:

* 10. If needed, the source IAB-donor-CU configures **~~BH RLC channels,~~** UL BH mappings on the descendent node and BAP-sublayer routing entries on the ~~target~~ path **between** ~~for~~ the descendant node~~s~~ and **the migrating IAB-node.** ~~BH RLC channel mappings on the descendant nodes in the same manner as described for the migrating IAB-node in step 2~~. ~~To enable parallel TNL migration of the descendant nodes, these configurations~~ **This step** may be performed at an earlier stage, e.g., immediately after step 4~~5, or before step 5~~.

**Proposal 7: Agree CR-250r to TS 38.401 in R3-224703 with the following revision:**

**1: Remove “for UL F1-C/non-F1 traffic” in the change in step 6.**

**2: Replace the wording of the new step 10 with the following wording: “10. If needed, the source IAB-donor-CU configures UL BH mappings on the descendent node and BAP-sublayer routing entries between the descendant node and the migrating IAB-node. This step may be performed at an earlier stage, e.g., immediately after step 4.”**

**3: Replace “8.17.2.1” in step 0 in figure 8.17.3.2-1** **with “8.17.3.1”.**

## 3.8 Rel-17 Misc CR to 38.473 on IAB

|  |  |  |
| --- | --- | --- |
| [R3-224715](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117-e%5CDocs%5CR3-224715.zip) | Miscellaneous corrections on IAB in TS 38.473 (ZTE) | CR1008r, TS 38.473 v17.1.0, Rel-17, Cat. F |

|  |  |
| --- | --- |
| ***Reason for change:*** | 1. In current specification, the description of Number of RB Sets IE in RB Set Configuration is “Number of configured RB sets. The RB sets are contiguous and non-overlapping. The start RB index of the first RB set is the lowest index of RB of the IAB-DU cell.”. However, the meaning of “the lowest index of RB of the IAB-DU cell” is not clear. As we know, there may be multiple carriers configured in one IAB-DU cell associated with different SCSs. So it is not clear which carrier should be used to determine “the lowest index of RB of the IAB-DU cell”. As captured in TS 38.473, Subcarrier Spacing IE is contained in the RB Set Configuration to indicate the Subcarrier spacing used as reference for the RB set configuration. So “the lowest index of RB of the IAB-DU cell” should be the lowest index of RB of the carrier corresponding to the *Subcarrier Spacing* IE.
2. During RAN3#116e meeting, the trigger condition for the descendant IAB node to transfer the buffered RRC message was discussed. Two alternatives were discussed, i.e. Alt1 is that the routing entries for the target path at descendant IAB-node is pre-configured from IAB-donor-CU; Alt 2 is that the default BH RLC CH is used if no routing entry exists for the received packets. There was no agreement on this issue. And it was captured in the meeting report that for next meeting, companies are encouraged to provide updates to stage2 for Alt1. It implies that we could try to agree to Alt1. So the trigger condition for the descendant IAB node to transfer the buffered RRC message needs to be updated to add one condition that it has one or more routing entries for the target path.
 |
|  |  |
| ***Summary of change:*** | 1. Clarify that “the lowest index of RB of the IAB-DU cell” in the description of *Number of RB Sets* IE should be the lowest index of RB of the carrier indicated by the *Subcarrier Spacing* IE.
2. The trigger condition for the descendant IAB node to transfer the buffered RRC message needs to be updated to add one condition that it has one or more routing entries for the target path.

**Impact analysis**Impact assessment towards the previous version of the specification (same release): This CR has isolated impact with the previous version of the specification (same release).This CR has impact under functional point of view. The impact can be considered isolated because the change affects only the IAB related procedure. |

**Q8: Do you support the CR to 38.473 proposed by** [R3-224715](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117-e%5CDocs%5CR3-224350.zip)**?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments if any** |
| Qualcomm | Yes |  |
| Huawei | See comment | The first change on the trigger condition of releasing buffered RRCReconfiguration to child node is incorrect and not needed, how can the descendant node know it has routing entry for "target path" or “source path”? The stage 2 change in 4503 is enough, as indicated in minutes in last meeting. The second change seems not needed also, the current text is clear. |
| Nokia |  | Question for clarification:* If “per DU cell” refers to one carrier (and there is separate configurations for each carrier, then the proposed change is not necessary
* However, if “per DU cell” covers multiple carriers, a clarification would be ok. Not sure if the modification should refer to subcarrier spacing of the carrier, or would just the carrier (if there is related identification) be sufficient)?
 |
| **Ericsson** | See the comments | For the first change we have the same view as Huawei.Regarding the second change, there are no multiple carriers per cell if IAB-DU. The current text in the spec is accurate and sufficient. |
| ZTE | Yes  | For the first change, we are fine on the stage 2 change in CR 4503. For the second change, regarding Nokia and Ericsson’s comment, there may be multiple carriers in a DU cell which is the same as normal NR cell. And **the carriers of a NR cell is defined in** ***NR Carrier List* IE in section 9.3.1.137**, which indicates the SCS-specific carriers per TDD, per DL, per UL or per SUL of an NR cell. So the change is necessary. Otherwise, the start RB of the first RB set cannot be determined correctly.  |
| Fujitsu | Yes |  |

**Summary:**

There is some controversy for the changes.

**Change 1:** There is some discussion if this change is actually needed. Two companies believe that the change is needed if the cell has multiple CCs. One company believes that this will not happen for the IAB-DU. Other companies believe it can happen. The moderator believes that we presently cannot preclude that the IAB-DU cell may have multiple CCs. Also, change 2 does not hurt. For that reason, we can simply add it.

**Change 2:** Some companies believe that adding the availability of a routing entry to the target path as a condition for the release of a buffered RRC Reconfiguration does not make sense, since the DN does not know if the routing entry it has points to the target path vs. the source path. The moderator agrees with this observation. Also, the CR discussed in section 3.6 has already addressed the author’s concern raised in this present CR R3-224715.

**Proposal 8: Agree change 1 of CR-1008r to TS 38.473 in R3-224715, i.e., clarification that “the lowest index of RB of the IAB-DU cell” in the description of Number of RB Sets IE should be the lowest index of RB of the carrier indicated by the Subcarrier Spacing IE.**

## 3.9 Rel-17 CR to 38.420 for IAB

|  |  |  |
| --- | --- | --- |
| [R3-224735](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117-e%5CDocs%5CR3-224735.zip) | Correction to 38.420 for IAB (CATT) | CR0032r, TS 38.420 v17.1.0, Rel-17, Cat. F |

|  |  |
| --- | --- |
| ***Reason for change:*** | The below IAB procedures are used to enable the transfer of F1-C, F1-U and non-F1 traffic for IAB.- IAB Transport Migration Management- IAB Transport Migration ModificationThe current spec. includes F1-C traffic only. |
|  |  |
| ***Summary of change:*** | Change “F1-C traffic” to “F1/non-F1 traffic” for IAB procedure.Impact Analysis:This CR has an isolated impact towards the previous version of the specification (same release).This CR only has an impact on the IAB function. |

**Q9: Do you support the CR to 38.420 proposed by** [R3-224735](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_117-e%5CDocs%5CR3-224350.zip)**?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments if any** |
| Qualcomm | Yes |  |
| Huawei | Yes |  |
| Nokia | No | The change is unnecessary. The related text corresponds to the F1-C Traffic Transfer procedure. F1-U is not transferred over Xn. |
| **Ericsson** | **Yes** | The result of the procedure is that all types of traffic, including both F1 and non-F1, can be transferred between donors.The **CR title mentions SL**, and that needs to be corrected. |
| ZTE | No  | Agree with Nokia, the text “to exchange information between the F1-terminating IAB-donor-CU and the non-F1-terminating IAB-donor-CU of a boundary IAB-node” is for IAB Transport Migration Management/Modification procedures. |
| CATT | Yes | The text “to exchange information between the F1-terminating IAB-donor-CU and the non-F1-terminating IAB-donor-CU of a boundary IAB-node” is for IAB Transport Migration Management/Modification procedures which are used to enable the transfer of F1-C, F1-U and non-F1 traffic;The text “to enable the delivery of F1-C traffic between the M-NG-RAN node and the S-NG-RAN node serving a dual-connected non-boundary IAB-node” is for F1-C Traffic Transfer;The text “to exchange resource multiplexing related information between the F1-terminating IAB-donor-CU and the non-F1-terminating IAB-donor-CU of a boundary IAB-node” is for IAB Resource Coordination;Sorry for wrong CR title, I will request a new Tdoc number when this CR is agreeable. |
| Fujitsu | Yes |  |
| Samsung | Yes |  |

Summary:

This is a minor change: “The IAB procedures are used to enable the transfer of F1/non-F1 traffic for IAB, to exchange information between the F1-terminating IAB-donor-CU and the non-F1-terminating IAB-donor-CU of a boundary IAB-node,…”

2 companies do not like the change since they claim that it only refers to F1-C transfer.

6 companies believe it refers to “enabling the transfer of F1/non-F1 traffic for IAB,” by using the Xn TRANSPORT MANAGEMENT/MODIFICATION procedures.

The moderator agrees with the majority that the Xn TRANSPORT MANAGEMENT/MODIFICATION procedures do enable the transfer of F1/non-F1 traffic for IAB. For that reason, the change makes sense.

The authors announced that they would have to change the title of the CR if approved.

**Proposal 9: Agree to change 1 of CR-0032r to TS 38.420 in R3-224735 after revision of title.**

# Discussion-Phase II

…