3GPP TSG-RAN WG3 #112-e R3-21xxxx

Online, May 17 – 27, 2021

Agenda Item: 13.2.3

Source: Qualcomm (moderator)

Title: CB#39 IAB\_TopoRed

Document for: Discussion

# Introduction

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| **CB: # 39\_IAB\_TopoRed**  **- (QC)**  **F1 can be established before or after the boundary node becomes redundantly connected. Neither option is precluded.**  **For a dual-connected IAB-node, F1 can be terminated at the MN or the SN. Neither of these two options is precluded.**  **decide if either option 5 or one of options 3a, 3b, 4 be supported; decide among options 3a, 3b and 4.**  **liaise RAN2 on its decision for/against option 5 and its preferences among options 3a, 3b and 4, if applicable**  **F1-terminating donor to pass egress BH RLC CH ID(s) for DL traffic and ingress BH RLC CH ID(s) for UL traffic to the non-F1-terminating donor.**  **- (CATT)**  **Confirm whether the F1-C is able to send via donor path in CP-UP separation after F1 setup procedure.**  **If F1-C is able to send via both paths in CP-UP separation, then MN decides which leg (MN or SN) transmits F1-C in R17 for both scenarios.**  **If F1-C is able to send via both paths in CP-UP separation, F1C-over-RRC for non-donor and F1C-over-BAP for donor is reasonable.**  **If F1-C is able to send via both paths in CP-UP separation, RAN3 discusses introducing an indication about which leg (MN or SN) transmits F1-C in UL. And whether this indication sends to IAB-DU via a RRC message or F1AP message**  **MN decides which NR-RAN (MN or SN) performs as a donor. MN should inform IAB node about who is the donor (MN or SN) via RRC and trigger F1 setup procedure**  **MN decides whether CP-UP separation or inter-donor redundancy**  **F1-termination donor CU sends QoS with BH RLC CH granularity to non-F1-termination donor CU for BH RLC CH allocation.**  **support option 4 and option 5. Details are FFS.**  **- (Nok)**  **OAM configures IAB-DU with a set of parameters (e.g. the Donor-CU IP address and IAB-DU parameters). When the IAB is dual-connected with 2 Donors, the MN is selected as the Donor, and OAM configures IAB with a set of parameters related to MN.**  **use RRC to inform the IAB about the leg for F1-C traffic transfer.**  **BH Information IE need to be enhanced to differentiate the parent node, e.g. when both parent nodes have same BAP address allocated by different IAB-donor-CU.**  **both Donors allocate the BAP address to the boundary IAB node and descendant IAB nodes.**  **Introduce a new XnAP procedure to support inter-Donor routing.**  **consider option 4 as a solution for address collision in inter donor TR.**  **- (SS)**  **Common st2 for all options**  **Prefer option 1**  **- (ZTE)**  **adopt option 1 and option 3a.**  **F1-terminating donor provides the following information of the migrated F1-U tunnel to the non-F1-terminating donor for the establishment of BAP routing via the target path:**  **- the identity of the F1-U tunnel**  **- QoS parameters of the DRB delivered via the F1-U tunnel**  **- routing ID of the F1-U tunnel**  **- (Fuj,Len,Moto,LG)**  **Prefer option 4**  **- (LG)**  **The scenario is needed, i.e, “when the F1 interface is established after IAB-MT of the access IAB node is connected with two parent nodes connected to two donors (the inter-donor topology redundancy is not established yet)”**  **For the case above, MN determines the F1 termination point for the IAB node.**  **- (HW)**  **Prefer option 5; option 4 is FFS**  **For bearer mapping at the boundary node, RAN3 agree to adopt IP header to egress BH RLC ID mapping.**  **F1-U terminating CU determines the QoS requirement division among the two topology segmentation, for inter-donor routing case. Details of how to achieve the QoS division are FFS, pending progress on the inter-donor routing and BH RLC CH mapping at the boundary node.**  **Liaise RAN 2 to discuss the following issues:**  **- Whether one or two BAP addresses should be allocated to the boundary node for inter-donor routing.**  **- The BAP address in BAP header added by the access node and IAB-donor-DU, for the inter-donor routing traffic (e.g. the BAP address of the real destination or that of the boundary node).**  **- For upstream traffic, how boundary node to differentiate the traffic to be further routed in CU1’s topology from the traffic to be routed to CU2’s topology;**  **- Chair: seems support for options 1, 3a, 4, 5? If agreeable that opt1 (OAM-based) is not precluded, concentrate discussion among 3a, 4, 5? WA to go for 4? If st2 is common for all options, attempt st2 TP**  **- note LS**  (QC - moderator)  Summary of offline disc [R3-212679](file:///C:\temporary\Users\ghampel\AppData\Local\Temp\Temp1_RAN3_112-e_agenda_with_Tdocs20210514_1403.zip\Inbox\R3-212679.zip) |

This CB#39 discussion has two phases:

**Phase 1: Identify potentially achievable agreements for online discussion.**

**Phase 2: TBD**

The deadline for Phase 1 is Thursday, May 20, 23:59:59 UTC. This allows the moderator to prepare some proposals on Friday for Monday’s online session.

The deadline for Phase 2 is the same as for all email discussions, i.e., Tuesday, May 25, 12:00:00 UTC.

*Disclaimer:*

*The moderator has tried to capture the most relevant issues of the contributions above. For some of them, the moderator has expanded the discussion, e.g., to alert companies to underlying assumptions, interdependences, and potential inconsistencies with prior agreements. To keep discussion within reasonable size, several aspects discussed in contributions could not be included, especially if they were very detailed or dependent on the convergence on superseding issues.*

# For the Chairman’s Notes

Propose the following:

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# PHASE 1: Discussion

## 3.1 Reply LS from RAN1 on inter-donor topological redundancy

RAN1 states in reply LS R3-211412:

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| Question from RAN3  “In both scenarios, the boundary IAB node, i.e., IAB3 in the figure, is simultaneously connected to the two parent nodes (i.e., IAB1 and IAB2) belonging to two different donors (i.e., donor 1 and donor 2). Since it may require the work in RAN1, RAN3 would like to get RAN1’s advice on whether this can be supported in Rel-17.”  Regarding the Question, RAN1 agreed that both inter-donor multi-parent scenarios (Scenario 1 and Scenario 2) can be supported in Rel-17 with RAN3 specification support for inter-donor coordination of   * H/S/NA resource configurations of the IAB-DU of the dual-connected node, and * DL/UL resource configurations of the parent DUs and the IAB-MT of the dual-connected node.   **ACTION:** RAN1 would like to ask RAN3 to take the above into consideration in future work. |

The moderator believes that this is an encouraging response. Details on inter-donor coordination of HSNA and DUF configurations are discussed in CB#42.

**Q1: Do you have any comments on RAN1’s reply LS?**

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## 3.2 NRDC before or after F1

Last meeting, it was discussed if NRDC can be established before F1.

R3-211942 (Samsung) proposes that NRDC can be established before F1 since DC could already be used for OAM interactions before the IAB-DU is launched.

R3-211801 (CATT) and R3-211893 (Nokia) indicate implicit support for this scenario since they discuss which of the nodes, MN or SN, be considered as the F1-termination point in this case.

R3-212384 (LGE) and R3-211741 (QC) also believe that it should be possible to establish NRDC before F1.

This decision has implications on the selection of CP-UP separation vs. redundancy and the selection of the F1 termination point.

R3-211801 (CATT) and R3-211942 (Samsung) propose that when F1 is established before NRDC, the MN should decide if inter-donor redundancy and/or CP-UP separation is used.

R3-211801 (CATT) proposes that when F1 is established after NRDC, the MN decides whether CP-UP separation or inter-donor redundancy is adopted in this case.

R3-211801 (CATT) and R3-212384 (LGE) propose that in this case, the MN decides the F1 termination point, and that it should inform the IAB-node about this decision via RRC.

R3-211893 (Nokia) proposes that F1-termination-point selection is done by the IAB-node through OAM: The IAB-node reports, e.g., parent-cell information to OAM upon which OAM configures the CU’s IP address on the IAB-node.

R3-211942 (Samsung) proposes that the IAB-node determines based on SIB1, which of the parents support IAB and selects the corresponding CU for F1 termination. In case one of the parents does not indicate IAB support, the corresponding CU is the non-donor for CP-UP separation. If both parents support IAB, it is up to IAB-node implementation to select one of them for F1 establishment.

The moderator would like to start with the first step of IAB-node integration, which is the parent node selection.

R3-211942 (Samsung) proposes that the IAB-node could select a donor opposed to a non-donor based on the SIB *IAB-supported* indicator in SIB.

The moderator would like to emphasize that this is a different approach than in Rel-16 IAB for ENDC, where the eNB *does* broadcast IAB-supported but it *does not* support donor functionality.

Therefore, the following options can be considered for parent-node selection, and please note that these options have implications on the support of NRDC before F1 establishment:

**Option A:** The parent associated with the non-donor **does not** broadcast *IAB-supported* in SIB.

This raises the question if the IAB-node could connect to this parent during network integration, i.e., in an equivalent manner as a Rel-16 ENDC IAB-node can connect to the eNB. It defines two sub-options.

**Option A1**: The IAB-node **cannot** connect to this parent during network integration.

* This implies that there is no analogue behavior in NRDC as in Rel-16 ENDC, where the IAB-node can integrate to the network via eNB.
* This further implies that the MN is always a donor node.
* In this option, establishment of F1 after ENDC may be precluded.

**Option A2**: The IAB-node **can** connect to this parent during network integration.

* This raises the question on how the IAB-node would select this parent node in absence of the *IAB-supported* indicator.
* In this option, the MN would have non-donor role and could therefore not become the F1 termination point.
* This further implies that establishment of NRDC *has* to occur before F1-C establishment.

**Option B:** The parent connecting to the non-donor **does** broadcast *IAB-supported* in SIB.

* This implies that the IAB-node can connect to this node during network integration (analogue to connection establishment to eNB in Rel-16 ENDC).
* The MN would therefore have non-donor role and could therefore not become the F1 termination point.
* This further implies that establishment of NRDC *has* to occur before F1-C establishment.
* This further implies that the MN needs to somehow ensure that the SN is a donor node.

Note that the selection among options A1, A2 and B on SIB indication of *IAB-supported* has significant implications on the selection of the F1 termination point (see section 3.3).

**Q2. Please indicate your preference among options A1, A2, or B. You can also propose another solution. Please justify your selection.**

* **In case you support A1, please indicate if you support establishment of F1 after NRDC.**
* **In case you support A2, please describe how the IAB-node would perform parent node selection.**
* **In case you support B, please describe how the MN would ensure that the SN is a donor node.**

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| Company | Option A1, A2, B, … | Comments |
| QCOM | Option B | We should try to align the functionality with that of Rel-16 ENDC. This supports the use case where the IAB-node uses FR1 for network integration and adds FR2 for BH support.  The MN can find donor SNs in the following manner:   * Option B1: It is preconfigured with donor-candidates. * Option B2: It obtains donor indication from SN during SN addition. |
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## 3.3 CP-UP separation vs. redundancy and F1-termination point

If F1 is established *before* NRDC, it is obvious that the MN becomes the F1-termination point and decides on CP-UP separation vs. redundancy after adding the SN.

If F1 is established *after* NRDC, the following two cases can be considered:

**Case a:** Only one CU supports donor functionality: In this case, CP-UP separation can be applied, and the donor becomes the F1-termination point.

**Case b:** Both CUs support donor functionality: Either CP-UP separation and/or redundancy can be used, and either node can be the F1 termination point.

For case b, we need to decide if *both* F1-C-over-BAP and F1-C-over-RRC can simultaneously be used over the *same* parent link?

R3-211942 (Samsung) believes it does not make a lot of sense to have both options available on the same parent link.

**Q3a: Do we allow that *both* F1-C-over-BAP *and* F1-C-over-RRC can be used over the *same* parent link?**

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| Company | Yes/No | Comments |
| QCOM | No | F1-C-over-RRC is supposed to provide redundancy to F1-C-over-BAP. There is no redundancy gain if it is use over the same link. |
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For case b, it further needs to be decided, which node selects CP-UP separation vs. redundancy as well as which node becomes the F1 termination point, and how this selection is communicated to the other nodes.

The following options can be considered:

**Option 1:** The IAB-node selects F1-termation point (e.g., based on OAM config).

The IAB-node informs the corresponding CU via RRC that this CU will be the F1-terminating node. The F1-terminating node can then select between redundancy or CP-UP separation based on the non-F1-terminating node’s donor capabilities and configure the L2 transport for F1 establishment.

**Option 2**: The MN selects the F1-terminating node.

**Option 2a:** The F1-terminating node selects between CP-UP separation vs. redundancy (considering the non-F1-terminating node’s donor capabilities).

**Option 2b:** The MN selects between CP-UP separation vs. redundancy and informs the F1-terminating point about the selection if this is the SN.

and establish the L2 transport for F1 establishment.

After this, the F1-terminating node can configure the L2 transport for F1 establishment.

**Option 3**: The SN selects the F1-terminating node.

**Option 3a:** The F1-terminating node selects between CP-UP separation vs. redundancy (considering the non-F1-terminating node’s donor capabilities).

**Option 3b:** The SN selects between CP-UP separation vs. redundancy and informs the F1-terminating point about the selection if this is the MN.

After this, the F1-terminating node can configure the L2 transport for F1 establishment.

Note that the F1-terminating CU cannot configure UL mapping or RRC transfer path *earlier* since it does not know if it will be selected as F1-terminating node.

Further, the IAB-node cannot select the F1-terminating CU by establishing F1-C using this CU’s IP address (as proposed by R3-211893) since the corresponding L2 paths have not been established, and they cannot be established before the F1-terminating CU has been selected.

**Q3b: Please indicate your preference among options 1, 2a, 2b, 3a, 3b. You can also propose another solution, but please consider all the above constraints. Please justify your selection.**

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| Company | Option 1, 2a, 2b, 3a, 3b,.. | Comments |
| QCOM | 2a | Options 2 and 3 do not rely on OAM which provides much better scalability.  Option 2 vs 3: It makes more sense having the MN take decisions rather than the SN.  Option 2a vs 2b: The F1-terminating node is certainly the donor and therefore it should be in charge to take decisions. The MN may not be a donor, and for that reason, it should not take control. |
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## 3.4 Void

This section has been deliberately left blank.

## 3.5 CU IP address determination

a) How does the IAB-node know the CU’s (outer and inner) IP address?

R3-211893 (Nokia) proposes via OAM. This is the way we went in Rel-16. Do we have room for any enhancements, e.g., have the donor configure this information?

**Q5a: How does IAB-node know the CU’s (outer and inner) address for F1-C establishment?**

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| Company | Comments |
| QCOM | OAM-based solution doesn’t scale very well. We discussed this already in Rel-16 for parent node selection.  The CU could inform the IAB-node on its IP address(es) via RRC. |
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## 3.6 Inter-donor redundancy: Topology issues

a) F1-termination point of boundary and descendant nodes

The following issues were raised on the F1 termination point for boundary and descendant nodes:

R3-211942 (Samsung) and R3-212165 (Lenovo) propose that the F1 termination point of these nodes should be the same.

R3-211942 (Samsung) proposes that the F1-termination point of these nodes should not change.

The moderator believes that these proposals may collide prior assumptions and agreements as shown in Figure 1:

* Fig 1a: The redundantly connected IAB-node-1 and its descendent IAB-node-2 have Donor-CU1 as their F1 termination point. IAB-node-3 has Donor-CU2 as F1 termination point.
* Fib 1b: Due to its deteriorating BH link, IAB-MT-3 is migrated to Donor-CU1 with IAB-node-1 as new parent node. At this point, IAB-DU-3 still has its F1-termination point at Donor-CU2.
* Fig 1c: IAB-DU-3’s F1 termination point is migrated to Donor-CU2. At this point, boundary and descendant nodes have the same F1 termination point.



**Figure 1: F1 termination point of descendant nodes before after IAB-node migration**

Based on this scenario, the following options can be identified:

**Option 1:** Boundary and descendent nodes can have different F1 termination.

**Option 2:** Boundary and descendent nodes must have the same termination point with the implication that:

**Option 2a:** Inter-donor IAB-node migration into the subtree of a redundantly connected node cannot be terminated at IAB-MT migration in case the IAB-DU has a different F1 termination point as the boundary node.

**Option 2b:** Inter-donor IAB-node migration/recovery to the subtree of a redundantly connected node is not supported if the IAB-DU has a different F1 termination point as the boundary node.

**Q6a: Which of the above options 1, 2a or 2b should be supported? Please explain.**

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| Company | Options 1, 2a or 2b | Comments |
| QCOM | 1 | It is certainly not attractive to have multiple boundary points chained up, but at should be supported for at least some intermediate time frame until the DU has been migrated. |
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b) Multi-donor redundancy

R3-212415 (Huawei) proposes that redundancy across more than 2 donors as show in Figure 2 should be deprioritized.



**Figure 2: IAB topology redundancy across multiple donors**

The moderator believes that the complexity in Fig.2 is primarily associated with the chain of boundary nodes rather than with the involvement of more than two donors. Figure 3, for instance, shows a few scenarios with two or three donors. In some of them, the boundary nodes reside in different branches (3a and 3b) which should be rather uncritical. Complexity seems to increase, when boundary nodes are chained up (3c and 3d). This, however, can also happy for the 2-donor scenario (3d).



**Figure 3: Various multi-donor scenarios**



**Figure 4: IAB-node migration resulting in topology redundancy across multiple donors**

Further, the scenario of IAB-node migration into the subtree shown in Fig. 1 may also occur for three donors (Fig. 4). In case IAB-node migration is terminated at the IAB-MT migration, the scenario will end up with topological redundancy across 3 donors.

Based on the Figures 3 and 4, the moderator would like to receive some feedback if any of these scenarios should be precluded, the criteria for precluding a scenario, and how such preclusion would be enforced in the deployment.

**Q6b: Please provide feedback on scenarios in Figures 3 and 4:**

* **Which of the multi-donor scenarios in Fig. 2 and 4 should be supported?**
* **What are criteria for a scenario to be precluded?**
* **How would these criteria be enforced by RAN? Does this require specification?**

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| Company | Comments |
| QCOM | All scenarios in Fig. 3 and 4 should be supported. Defining mechanisms to preclude some scenarios makes things only more complicated than they already are. |
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## 3.7 Inter-topology transport

a) Inter-topology BAP routing options

There has been a lot of discussion in contributions on this topic. RAN3 should at least decide if option 5 vs. options 3a, 3b and 4 should be supported. Selection among options 3a, 3b and 4 is technically in RAN2 realm.

The moderator believes that it would be beneficial for RAN3 to agree on a *preferred* option among 3a, 3b and 4 to make progress. This may help RAN2, which has just started to think about inter-donor redundancy.

The contributions provide the following views:

R3-211801 (CATT) proposes option 4 and 5.

R3-211893 (Nokia) proposes option 4.

R3-211942 (Samsung) proposes to NOT use option 5.

R3-212039 (ZTE) proposes option 3a.

R3-212048 (Fujitsu) proposes option 4.

R3-212165 (Lenovo) proposes option 4.

R3-212384 (LGE) proposes option 4

R3-212415 (Huawei) supports 5, potentially also options 4

In an RAN2 email discussion and in RAN contributions, option 4 generally received the majority support. RAN3 contributions are in line with this tendency. To make progress, the moderator proposes that RAN3 deprioritizes option 5 and agrees on option 4 as the preferred candidate.

**Q7a: Do you agree that option 5 is deprioritized, and option 4 is RAN3’s preferred candidate? Should RAN2 be liaised on RAN3’s decision on this matter?**

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| QCOM | Yes |  |
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b) Number of BAP addresses and traffic differentiation at boundary node

R3-211893 (Nokia) proposes that the boundary node has two BAP addresses, one for each topology, and that each donor configures the IAB-node with a BAP address.

R3-212415 (Huawei) raises the issue of the number of addresses at the boundary node, and how the boundary node should differentiate traffic (1) for itself, (2) to be forwarded in the same topology, (3) to be forwarded to the other topology. They propose that RAN3 should ask RAN2 to resolve it.

The moderator believes that:

* Both, RAN2 and RAN3, should have a solid understanding of this matter. RAN3 should therefore have this discussion and potentially share their views with RAN2.
* BAP addressing and criteria for traffic differentiation at the boundary node depend on the inter-topology BAP routing option selected.
* The handling of these issues is actually rather simple. To make progress, the moderator outlines a baseline below on how this could work. Companies are asked to provide feedback.

**Moderator’s view: Baseline on the number of BAP addresses assigned to the boundary node:**

* For option 3a, all IAB-nodes including the boundary node have only one global address which is {BAP address assigned by one CU + CU ID}.
* For option 4 and option 5, the boundary node needs (at least) one BAP address in each topology, which is assigned by the respective donor. This is necessary to avoid BAP address collision since each donor manages its own BAP name space in its own topology.

**Moderator’s view: Baseline on traffic differentiation at the boundary node:**

* For option 3a, the boundary node routes traffic based on {BAP address + CU ID} using the same routing principals is in Rel-16.
* For option 4, the boundary node distinguishes traffic in the following manner:
  1. Packets for the boundary node itself carry the boundary-node’s BAP address assigned for the topology where the packet arrives.
  2. Packets to be forwarded without header rewriting carry a BAP address of the destination node for the topology, where the packet arrives.
  3. Packets to be forwarded with header rewriting need to carry a BAP address that is unique within the topology, where the packet arrives, i.e., it cannot be used by any other IAB-node in that topology. It could be the same address as that of the boundary node. In this case, the BAP path ID would be used to differentiate between of 1) and 3).
* For option 5, the boundary node distinguishes traffic in the following manner:

1. Packets for the boundary node itself carry the boundary-node’s BAP address and IP address assigned for the topology where the packets arrive.
2. Packets to be forwarded without header rewriting carry a BAP address of the destination node for the same topology where the packet arrives.
3. Packets to be forwarded with header rewriting carry the BAP address of the boundary node, that has to be unique within the topology, where the packet arrives, *and* the IP address of the destination node. The BAP sublayer will pass the packet up to the IP layer, which will perform IP routing using IP-to-BAP mapping as presently defined for the donor-DU.

Option 3b has not been discussed here since no company seems to support it.

**Q7b: Do you agree with the moderator’s baseline description of BAP addressing and traffic differentiation at the boundary node? If not, why not? What is missing? What is wrong? “NO” will only be considered if accompanied by proper explanation.**

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| QCOM | Yes |  |
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c) Granularity of QoS information to be transmitted from F1-terminating to non-F1-terminating donor.

RAN3 agreed in last meeting:

To support the bearer mapping across two topologies at the boundary IAB node, the non-F1-termination donor CU needs to provide the ingress BH RLC CH ID(s) for DL traffic and egress BH RLC CH ID(s) for UL traffic to the F1-termination donor CU.

The issue to be addressed is what information the F1-terminating donor needs to provide to the non-F1-terminating donor before.

Contributions have established two different options: The F1-terminating donor provides:

**Option 1: Ingress BH RLC CH info for UL traffic and egress BH RLC CH info DL traffic.**

**Option 2: F1-U GTP-U tunnel information for all F1-U to be migrated.**

R3-211801 (CATT), R3-211741 (QC) and R3-212165 (Lenovo) are in favor of option 1.

R3-211942 (Samsung) and R3-212039 (ZTE) are in favor of option 2.

The moderator wants to emphasize that both options allow traffic offload with granularity of F1-U tunnel.

The moderator sees some problems in option 2 and would like to receive feedback from companies. Figure 5 shows an example for option 1 on top and option 2 at the bottom. In this example, red and pink F1-U tunnels are migrated, but the orange F1-U tunnel remains at the initial path.

In option1, the F1-terminating donor (CU1) forwards the green RLC CH info to the non-F1-terminating donor (CU2), upon which CU2 returns the blue RLC CH info. Blue and green RLC channels are matched 1:1 at the boundary node. In this manner, offloaded traffic will have the same bearer mapping in topology 2 as in topology 1.

In option 2, the F1-terminating donor (CU1) forwards F1-U information to the non-F1-terminating donor (CU2), upon which CU2 returns the blue RLC CH info. This allows CU2 to determine its own bearer mapping. In Figure 5, it ends up with **two** RLC channels (blue and purple) in topology 2 that need to be mapped to **one** RLC channel (green) in topology 1. This implies that the boundary node needs to support “bearer-remapping”. **How would this be done?**

R3-212048 (Fujitsu) proposes that the F1-terminating node indicates an egress BH RLC CH it at the boundary node to the non-F1-terminating node and if 1:1 bearer mapping is required. This still keeps the issue of bearer remapping for N:1-mapped bearers.

R3-212415 (Huawei) proposes that the bearer mapping at the boundary node is based on IP header information. This would only work for BAP routing option 5.



**Figure 5: Granularity of QoS info exchanged between donors**

**Q7c: Which of options 1 or 2 do you prefer:**

**Option 1: F1 terminating donor sends BH RLC CH info to non-F1-terminating donor.**

**Option 2: F1 terminating donor sends F1-U GTP-U tunnel info to non-F1-terminating donor.**

**In case of option 2, please indicate how bearer remapping should occur at the boundary node.**

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| Company | Option 1 or Option 2 | Comments |
| QCOM | 1 | We believe that option 2 adds unnecessary complexity and signaling overhead.  In case many companies prefer option 2, we are open to have both options supported.  In option 2, bearer remapping at the boundary node can be achieved by including the BAP routing ID into the ingress-to-egress BH RLC channel dependent on. As a result, the F1-terminating donor may have to reconfigure the F1’s BAP routing IDs so that they can be mapped to the fine-granular BH RLC CHs (blue and purple) sent by the non-F1-terminating donor. |
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d) Inter-donor coordination

This is on new Xn procedures for inter-donor coordination.

R3-211893 (Nokia) proposes: Since IAB-DU on dual-connected IAB-node has only one F1-C to one donor, a new Xn procedure is needed for inter-donor routing and traffic mapping.

R3-211942 (Samsung) proposes that such Xn procedures should use non-UE associated signaling. The reason is that the non-F1-terminating donor has no context of the UEs.

The moderator emphasizes that in fact, UE-associated signaling *can* be used and *should* be used since the “UE” refers to the IAB-MT.

R3-211942 (Samsung) further proposes that inter-donor coordination procedures for inter-donor topological redundancy should contain: 1) Inter-donor Context Setup procedure, 2) Inter-donor Context Modification Request procedure, 3) Inter-donor Context Modification Required procedure, 4) Inter-donor Context Release procedure.

**Q7d: Do you agree that:**

* **A new UE-associated signaling procedure is introduced for inter-donor routing and traffic mapping,**
* **The procedure includes Context Setup, Context Modification Request, Context Modification Required and Context Release procedures.**

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| Company | Yes/No | Comments |
| QCOM | See comment | We agree on the introduction of a new procedure. We are not yet certain about the specific messages proposed. |
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e) Boundary-node IP addresses:

R3-211942 (Samsung) proposes that the boundary node obtains an independent set of IP addresses from F1-terminating and non-F1-terminating node.

**Q7e: Do you agree that the boundary node obtains an independent set of IP address from F1-terminating and non-F1-terminating donor?**

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| Company | Yes/No | Comments |
| QCOM | Yes |  |
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# PHASE II…[if needed]

If needed

# References

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| --- | --- | --- |
| [R3-211412](file:///C:\temporary\Users\ghampel\AppData\Local\Temp\Temp1_RAN3_112-e_agenda_with_Tdocs20210514_1403.zip\Docs\R3-211412.zip) | Reply LS on inter-donor topology redundancy (RAN WG1) | LS in  Move to 13.2.3 |
| [R3-211741](file:///C:\temporary\Users\ghampel\AppData\Local\Temp\Temp1_RAN3_112-e_agenda_with_Tdocs20210514_1403.zip\Docs\R3-211741.zip) | Backhaul transport for inter-donor redundancy (Qualcomm Incorporated) | discussion |
| [R3-211801](file:///C:\temporary\Users\ghampel\AppData\Local\Temp\Temp1_RAN3_112-e_agenda_with_Tdocs20210514_1403.zip\Docs\R3-211801.zip) | CP-UP separation and inter-donor topology redundancy (CATT) | discussion |
| [R3-211893](file:///C:\temporary\Users\ghampel\AppData\Local\Temp\Temp1_RAN3_112-e_agenda_with_Tdocs20210514_1403.zip\Docs\R3-211893.zip) | discussion on Inter-CU topology redundancy (Nokia, Nokia Shanghai Bell) | discussion |
| [R3-211942](file:///C:\temporary\Users\ghampel\AppData\Local\Temp\Temp1_RAN3_112-e_agenda_with_Tdocs20210514_1403.zip\Docs\R3-211942.zip) | Discussion on topology redundancy for Rel-17 IAB (Samsung) | discussion |
| [R3-212039](file:///C:\temporary\Users\ghampel\AppData\Local\Temp\Temp1_RAN3_112-e_agenda_with_Tdocs20210514_1403.zip\Docs\R3-212039.zip) | Discussion on CP/UP separation and topology redundancy (ZTE) | discussion |
| [R3-212048](file:///C:\temporary\Users\ghampel\AppData\Local\Temp\Temp1_RAN3_112-e_agenda_with_Tdocs20210514_1403.zip\Docs\R3-212048.zip) | Discussion on the inter-donor topology redundancy (Fujitsu) | discussion |
| [R3-212165](file:///C:\temporary\Users\ghampel\AppData\Local\Temp\Temp1_RAN3_112-e_agenda_with_Tdocs20210514_1403.zip\Docs\R3-212165.zip) | Discussion on IAB inter-donor topology redundancy (Lenovo, Motorola Mobility) | discussion |
| [R3-212384](file:///C:\temporary\Users\ghampel\AppData\Local\Temp\Temp1_RAN3_112-e_agenda_with_Tdocs20210514_1403.zip\Docs\R3-212384.zip) | Open issues on topological redundancy for IAB (LG Electronics) | discussion |
| [R3-212415](file:///C:\temporary\Users\ghampel\AppData\Local\Temp\Temp1_RAN3_112-e_agenda_with_Tdocs20210514_1403.zip\Docs\R3-212415.zip) | Inter-CU topology redundancy (Huawei) | discussion |