3GPP TSG-RAN WG2 #113e Tdoc R2-20xxxx

Electronic meeting, 25th January – 5th February 2021

Agenda Item: 8.4.1

Source: Ericsson

Title: Summary of [AT113-e][030][eIAB] Reply LS DAPS-like solution (Ericsson)

Document for: Discussion, Decision

# 1 Introduction

This paper addresses the following email discussion:

* [AT113-e][030][eIAB] Reply LS DAPS-like solution (Ericsson)

Scope: Achieve common understanding of what is to be achieved by request by R3 in R2-2100038. Collect comments to facilitate efficient on-line discussion on how to reply. Can Take submitted papers on the topic into account e.g. to determine the options.

Intended outcome: Report with organized options / comments

Deadline: To be treated on-line Thursday Feb 28

The rapporteur would like to set the following deadline:

**Deadline: Wednesday, 27th Jan. 1500 UTC**

# 2 Discussion

This email discussion aims at discussing how to reply to RAN3 LS R2-2100038. For convenience, the LS is reported here:

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| 1. **Overall Description:**   RAN3 discussed the “DAPS-like” solution, and the following agreement is achieved:  Discuss how to support simultaneous connectivity with 2 donors, to reduce service interruption; potential solutions may include dual-protocol-stack solutions (“DAPS-like”); FFS whether the same solution also applies to descendant nodes.  The simultaneous connectivity dual-protocol solution (“DAPS-like”) of an IAB node should allow at least simultaneous DL reception of BH traffic carried on BH RLC channels on the paths from both donors  However, RAN3 cannot reach agreement for the UL simultaneous transmission since it may have impact to IAB-MT part. Thus, RAN3 would like to ask RAN2’s advice on whether simultaneous UL transmission can be supported in Rel-17. **2. Actions:** **To RAN2:**  **ACTION:** RAN3 respectfully asks RAN2 to take the above into account and to provide feedback. |

Hence, according to the request in the above LS, RAN2 should discuss in this email discussion whether simultaneous UL transmission can be supported in Rel.17.

Regarding this topic, the following contributions submitted to RAN2#113e were explicitly treating this topic:

* [R2-2100360](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2100360.zip), [Discussion on RAN3 LS of DAPS-like solution](https://ericsson.sharepoint.com/R2-2100360.zip), Intel Corporation
* [R2-2101450](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2101450.zip), [LS on DAPS-like solution for service interruption reduction](https://ericsson.sharepoint.com/R2-2101450.zip), Ericsson
* [R2-2100226](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2100226.zip), [CHO and DAPS](https://ericsson.sharepoint.com/R2-2100226.zip), CATT

## 2.2 Rel-17 DAPS-like solution for IAB

## From RAN3#110 chairman notes the following agreement is captured:

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| **The simultaneous connectivity dual-protocol-stack solutions (“DAPS-like”) of an IAB node should allow at least DL simultaneous transmission of BH traffic carried on BH RLC channels, on the paths to both donors.** |

Before discussing whether simultaneous UL transmission can be supported in Rel-17 for “DAPS-like” IAB, Rapporteur would like to discuss what is a “DAPS-like” solution from a RAN2 protocol architecture and taking into account the above RAN3 agreement.  
Rapporteur would set the following definition:

“A DAPS-like solution for IAB consists of two independent protocols PHY/MAC/RLC/BAP defined in the MT”

**Q1: Do you agree with the definition that a DAPS-like solution for IAB, from a RAN2 protocol view, consists of two independent protocol stacks “PHY/MAC/RLC/BAP” defined in the MT? If no, please provide your definition.**

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| **Company** | **Preference (Y/N)** | **Comments** |
| Nokia | N | The RAN3 agreement is (the green sentence only): “dual-protocol-stack solutions of an IAB node should allow at least DL simultaneous transmission of BH traffic carried on BH RLC channels, on the paths to both donors.”  To meet the requirements, DAPS-like solution for IAB, from RAN2 protocol view, would be feasible once similar to DC: PHY/MAC/RLC would be independent. However, BAP is a common entity and cannot be independent since UL/DL BAP routing happens in the BAP layer. DAPS-like solution should involve a single BAP entity.  Furthermore, DAPS is defined for HO to reduce interruption in UE data transmission. Similarly, if DAPS-like were adopted for IAB-nodes, it should be specified for reduction of service interruption in case of IAB-node migration, not for specifying another multiconnection scheme for IAB-nodes.  DL and UL redundancy is already supported with DC. Therefore, there is no need to specify an alternative option for the redundancy. |
| Sony | Y | In general agree but BAP could be common to both. It is good to inform RAN3 that DAPS like applies to single MT only. |
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## The RAN3 LS asks whether simultaneous UL transmission can be supported in Rel-17 for “DAPS-like” IAB. Looking that legacy DAPS, tt is noted that a capability signalling already exists indicating whether the UE supports simultaneous UL transmission in source PCell and target PCell during an inter-freq DAPS handover, i.e. *interFreqMultiUL-TransmissionDAPS-r16*. However, Rapporteur´s understanding is that after random access completion on the target cell, there is an uplink data switching at PDCP level from source to target which makes not possible simultaneous UL transmissions on source and target after the handover completion.

Companies are asked to provide their views on the legacy DAPS functionality when it comes to simultaneous UL transmissions on source and target

**Q2: Do you agree with the following Rapporteur´s understanding on the Rel.16 DAPS functionality related to UL simultaneous transmissions on source and target? If not, please provide your view or clarification if needed.**

* *interFreqMultiUL-TransmissionDAPS-r16* already indicates whether the UE supports simultaneous UL transmission in source PCell and target PCell during an inter-freq DAPS handover.
* After random access completion on the target cell, there is an uplink data switching at PDCP level from source to target which makes not possible simultaneous UL transmissions on source and target after the handover completion.

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| **Company** | **Preference (Y/N)** | **Comments** |
| Nokia |  | After successful RA there is UL switch. Simultaneous UL **data** transmission is not possible after the handover completion. |
| Sony | Y |  |
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## Related to DAPS-like solution for IAB, according to [R2-2100360](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2100360.zip), simultaneous UL transmission for IAB DAPS should not be supported in Rel.17 either, while according to [R2-2101450](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2101450.zip) that should be possible. Before agreeing on whether simultaneous UL transmissions for IAB DAPS can be supported in Rel.17, Rapporteur would like to ask companies how to support simultaneous UL transmissions for an IAB DAPS-like solution from a RAN2 point of view, and which changes (if any) can be foreseen in RAN2 specifications. Companies are also invited to provide the reason for the envisaged changes.

**Q3: How could simultaneous UL transmissions be supported using a DAPS-like solution in RAN2 specifications and what is the foreseen RAN2 standard impact?**

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| **Company** | **Changes foreseen to RAN2 specifications** | **Reason for the change** |
| Nokia | New concept for the controlling entity above PHY/MAC/RLC: BAP routing and routing tables needs to be redefined  Configuration of IAB nodes (more changes to F1AP since BAP is mostly configured by it) | Instead of MCG and SCG there will be a primary stack and secondary stack  New option for the topological redundancy needs to be configured. |
| Sony | In our understanding, configuration of multiple BH RLC channels is already supported in RRC and higher layers may take care of reordering and duplication detection. |  |
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Depending on the changes foreseen in the previous question, Rapporteur would like to ask now whether RAN2 foresees any fundamental issue for not supporting simultaneous UL transmissions in IAB DAPS. An additional option could be that RAN2 asks RAN1 whether that is feasible from their point of view, since also their specifications might be eventually impacted.

**Q4: Given the changes foreseen in Q3, do you see, from a RAN2 point of view, any fundamental issue for not supporting simultaneous UL transmissions with an IAB DAPS-like solution? Please explain your answer.**

* **Option 1: No**
* **Option 2: Yes**
* **Option 3: RAN2 asks RAN1 whether simultaneous UL transmissions can be supported in Rel-17 from their point of view**

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| **Company** | **Option(s)** | **Detailed Comments** |
| Nokia | Option 2 | IAB Rel16 already supports the topological redundancy with DC which allows simultaneous transmissions and load balancing in both DL and UL. There is no need to specify an alternative (multi-MT) option for the same functionality as proposed in R2-2101449. |
| Sony | Option 1/3 | We think RAN1 involvement is needed |
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# 3 Conclusion

To be updated