3GPP TSG-RAN WG3 #128 R3-253789

Malta, MT, 19th – 23rd , May, 2025

Agenda Item: 12.2

Source: NTTDOCOMO (moderator)

Title: Summary of Offline Discussion on additional topological enhancement

Document for: Approval

# For chair notes

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# Introduction

This document provides a summary of the offline discussion on additional topological enhancements.

**CB: # WAB**

**- Discuss the open points captured**

**- Discuss on possible LS to RAN1 and RAN2**

**- Discuss** **whether there is a need to reply to the LS from SA2 on multihop**

**- Agree to TPs if needed**

(moderator - DoCoMo)

Summary of offline disc R3-253789

# Discussion

## Resource coordination

Adopt the following principles for WAB resource coordination:

* The specifications shall not define any priority between the WAB-gNB or the BH-gNB on how to split resources.
* It needs to be further discussed if time domain and/or frequency domain coordination is supported
* It needs to be further discussed if indication of soft resources (the “S” in HSNA) is supported.
* It needs to be further discussed if only the WAB-gNB should be able to indicate the hard/not available resource allocation.
* It is FFS whether to send an LS to RAN1/RAN2 on the above “to be continued” points
* Option2(R3-253169):

– Reuse IAB resource coordination framework(i.e. reuse IEs and procedures introduced for IAB feature for WAB). FFS on the exceptions.

– Support both F1 and Xn for resource coordination. Otherwise, no resource coordination feature to be supported.

* Option3(R3-253345):
* Introduce WAB specific procedure for resource multiplexing in XnAP, as agreed in previous meeting, try to reuse the IEs introduced for IAB features as much as possible.
* Option 4 (R3-253537):

- Support both F1 and Xn for resource coordination, introduce WAB specific procedures in XnAP and F1AP. All resource multiplexing features introduced for IAB are applied to WAB unless not applicable.

## Statelite backhauling

**Proposal 6: RAN3 discuss how a WAB node know the BH-gNB is using a satellite link. Possible options include BH-gNB informs WAB-gNB via Xn.**

**Proposal 6: If the backhaul is NTN link, the WAB-gNB informs UE’s CN that the BH link RAT type is NTN.**

## Xn management

To be continued:

The WAB-gNB should be able to know the (target) BH-gNB during the WAB-MT HO or initial access

To be continued:

The BH-gNB can provide the TNL information of neighbour gNBs to the WAB node.

## whether there is a need to reply to the LS from SA2 on multihop

# References

|  |  |  |
| --- | --- | --- |
| [R3-253013](file:///D:\会议硬盘\TSGR3_128\Docs\R3-253013.zip) | Reply LS on FS\_VMR\_Ph2 solution impacts to RAN (Additional ULI) (SA2(Qualcomm)) | LS in  Noted |
| [R3-253018](file:///D:\会议硬盘\TSGR3_128\Docs\R3-253018.zip) | Reply LS on MWAB-gNB Configurations (SA2(Qualcomm)) | LS in  Noted |
| [R3-253019](file:///D:\会议硬盘\TSGR3_128\Docs\R3-253019.zip) | Reply LS on PWS enhancement for MWAB and MBSR (SA2(Ericsson)) | LS in  Noted |
| [R3-253390](file:///D:\会议硬盘\TSGR3_128\Docs\R3-253390.zip) | (TP to BL CR for TS 38.401) Discussion on NG/Xn management and other Stage-2 issues for WAB (Nokia, Nokia Shanghai Bell) | other |
| [R3-253168](file:///D:\会议硬盘\TSGR3_128\Docs\R3-253168.zip) | Remaining aspects of WAB (Qualcomm Inc.) | discussion |
| [R3-253132](file:///D:\会议硬盘\TSGR3_128\Docs\R3-253132.zip) | WAB-Node Resource Coordination (Ericsson) | discussion |
| [R3-253414](file:///D:\会议硬盘\TSGR3_128\Docs\R3-253414.zip) | Way Forward On Multi-hop Prevention for WAB (China Telecom, CATT, Huawei, DoCoMo, Lenovo, Samsung, NEC) | discussion |
| [R3-253131](file:///D:\会议硬盘\TSGR3_128\Docs\R3-253131.zip) | (TP for WAB BL CR for TS 38.401): Functional Aspects of WAB-Nodes (Ericsson, Jio Platforms) | other |
| [R3-253169](file:///D:\会议硬盘\TSGR3_128\Docs\R3-253169.zip) | WAB radio resource coordination (Qualcomm Inc.) | discussion |
| [R3-253170](file:///D:\会议硬盘\TSGR3_128\Docs\R3-253170.zip) | BL draft CR to TS 38.300 on Support of WAB (Qualcomm, Ericsson, CATT, ZTE, Nokia, Nokia Shanghai Bell) | draftCR |
| [R3-253175](file:///D:\会议硬盘\TSGR3_128\Docs\R3-253175.zip) | Further consideration on support of WAB (LG Electronics) | discussion |
| [R3-253176](file:///D:\会议硬盘\TSGR3_128\Docs\R3-253176.zip) | (TP to TS 38.401, 38.413 and 38.423) TP for WAB support (LG Electronics) | other |
| [R3-253211](file:///D:\会议硬盘\TSGR3_128\Docs\R3-253211.zip) | (TP to BL CR of 38.423 on WAB) Discussion on access and reliability for WAB (NEC) | other |
| [R3-253223](file:///D:\会议硬盘\TSGR3_128\Docs\R3-253223.zip) | Remaining aspects for the support of WAB (CANON Research Centre France) | discussion |
| [R3-253301](file:///D:\会议硬盘\TSGR3_128\Docs\R3-253301.zip) | [Draft] LS on Multi-hop Topology Avoidance for WAB (CATT, China Telecom, Huawei, NTT Docomo, Lenovo, Samsung, NEC) | LS out To: RAN2 CC: SA2 |
| [R3-253302](file:///D:\会议硬盘\TSGR3_128\Docs\R3-253302.zip) | (TP for BLCR to 38.401) On support of WAB (CATT) | other |
| [R3-253303](file:///D:\会议硬盘\TSGR3_128\Docs\R3-253303.zip) | (TP for BLCRs to 38.423, 38.473) On resource coordination and Xn management for WAB (CATT) | other |
| [R3-253320](file:///D:\会议硬盘\TSGR3_128\Docs\R3-253320.zip) | (TP to BL CR 38.423) Architecture and configuration for WAB-node (Lenovo) | other |
| [R3-253321](file:///D:\会议硬盘\TSGR3_128\Docs\R3-253321.zip) | (TP to BL CR 38.423) Radio resource configuration for WAB-node (Lenovo) | other |
| [R3-253344](file:///D:\会议硬盘\TSGR3_128\Docs\R3-253344.zip) | (TPs for WAB BL CRs) Architecture, Access Control and Additional ULI for WAB (Huawei) | other |
| [R3-253345](file:///D:\会议硬盘\TSGR3_128\Docs\R3-253345.zip) | (TP for WAB BL CRs) Radio Resource multiplexing Coordination for WAB-node (Huawei) | other |
| [R3-253391](file:///D:\会议硬盘\TSGR3_128\Docs\R3-253391.zip) | (TP to BL CR for TS 38.413 and TS 38.423) Enhancement for WAB (Nokia, Nokia Shanghai Bell) | other |
| [R3-253404](file:///D:\会议硬盘\TSGR3_128\Docs\R3-253404.zip) | (TP to 38.413, 38.401) Discussion on remaining issues for support of WAB (ZTE Corporation) | other |
| [R3-253412](file:///D:\会议硬盘\TSGR3_128\Docs\R3-253412.zip) | Discussion on Wireless Access Backhaul (NTT DOCOMO INC.) | discussion |
| [R3-253415](file:///D:\会议硬盘\TSGR3_128\Docs\R3-253415.zip) | RAN2 impact of WAB (China Telecom) | discussion |
| [R3-253537](file:///D:\会议硬盘\TSGR3_128\Docs\R3-253537.zip) | (TP to 38.423 38.473) Supporting resource coordination in WAB (ZTE Corporation) | other |
| [R3-253635](file:///D:\会议硬盘\TSGR3_128\Docs\R3-253635.zip) | (TP to BLCR for TS 38.410) Discussion on WAB mobility (Samsung) | discussion |
| [R3-253636](file:///D:\会议硬盘\TSGR3_128\Docs\R3-253636.zip) | Discussion on the left issues for WAB (Samsung) | discussion |
| [R3-253760](file:///C:\Users\5088196\Downloads\Inbox\R3-253760.zip) | Summary of Offline Discussion on additional topological enhancement (NTT Docomo) | discussion |
| The “WAB-MT ID” sent from the WAB-gNB to the BH-gNB consists of the WAB-MT’s C-RNTI assigned by the BH-gNB and the cell id of BH-gNB´s cell serving the WAB MT.  Huawei: the two proposals above shall be taken together  Ericsson: We can take the proposals one by one  Nokia, Qualcomm, ZTE: agree to merge the two proposals into one  Lenovo: the information needs to be also sent to the neighbour gNB  It is possible to establish an Xn connection between two WAB-gNBs. It is possible to prevent establishment of such connections  Samsung: the objective of the WID is to avoid Xn connecitons between WAB gNBs  Ericsson: we should discuss solutions for preventing such connecitons but that does not forbid to establish the connection  QC: we have tools to identify that an Xn connection is established between two WAB gNBs, hence we can prevent such connecitons  Samsung: we should deprioritize this issue  Huawei: preventing Xn establishment should be possible but is not mandatory  Nokia: prevention is ensured by means of standardised mechanisms  Canon: it is beneficial to allow Xn connections between WAB gNBs  To be continued:  The WAB-gNB should be notified about the target BH-gNB before the WAB-MT HO  Nokia: why is this agreement needed? Is it for resource coordination?  Ericsson: resource coordination is one possible reason.  Qualcomm: It is possible for the WAB gNB to establish an Xn before the WAB MT connects to a particular node. The proposal though has nothing to do with Xn setup and it should be skipped  Huawei: Agree with QC.  To be continued:  The BH-gNB can provide the TNL information of neighbour gNBs to the WAB node.  QC: we cannot agree to this as it is out of WID scope  Samsung: The WID has the proposal in scope.  CATT: not necessary to support this enhancement. Without it there is no issue, legacy procedures are enough  Huawei: Important for Xn management as a WAB node can move and providing TNL addresses saves time foir Xn establishment  Qualcomm: it is not urgent to tackle this issue. There are legacy solutions to solve the problem  Nokia: it is not possible to use the Neighbour relation table to discover neighbours and trigger Xn setup. This is why the proposal is useful.  Resource Coordination  Adopt the following principles for WAB resource coordination:   * The specifications shall not define any priority between the WAB-gNB or the BH-gNB on how to split resources. * It needs to be further discussed if time domain and/or frequency domain coordination is supported * It needs to be further discussed if indication of soft resources (the “S” in HSNA) is supported. * It needs to be further discussed if only the WAB-gNB should be able to indicate the hard/not available resource allocation. * It is FFS whether to send an LS to RAN1/RAN2 on the above “to be continued” points   Huawei: in Rel17 IAB both time and frequency domain coordination is possible, why not the same for WAB?  Qualcomm: Agree with Huawei. RAN1 has worked extensively on resource coordination for time and frequency. Letñ´s keep the framework as it is for IAB  CATT: agree with QC and Huawei. We should not restrict what already agree for IAB, otherwise the topic will have to be reopened in RAN1  Ericsson: this is incorrect because even if we adopt frequency level coordination RAN1 needs to be involved. If we support only time coordination RAN1 has no impact.  ZTE: we need to ask RAN1 for confirmation of how on support of split resources in FDD and TDD for WAB. Based on what do we decide in RAN3 not to support e.g. frequency level split  Samsung, Lenovo: agree with QC, Huawei and ZTE. Only supporting time domain is restrictive  Nokia: suggest to start with time domain support, i.e. TDD  Ericsson: limiting to TDD is not restrictive. Copying resource coordination solutions from IAB is not efficient, as it creates many options and complexity  Qualcomm, Huawei: to be left to RAN1 whether indication of soft resources should be supported  ZTE: we might not have time in case RAN1 replies that an indication for soft resources is needed  Samsung: even if there is no much time an LS to RAN1 is needed.  Qualcomm: we agreed that there should be no priority between the WAB gNB and the BH gNB, hence there should be no such indication  Huawei: we agree with an indication of hard/not available resource allocation, as this is the same for IAB  Qualcomm: given the time remaining in the WI, we should send an LS to RAN1 as soon as possible   * Option2:   – Reuse IAB ASN.1 (i.e. reuse IEs and procedures introduced for IAB feature for WAB). FFS on the exceptions.  – Support both F1 and Xn for resource coordination. Otherwise, no resource coordination feature to be supported.   * Option3: * Introduce WAB specific procedure for resource multiplexing in XnAP, as agreed in previous meeting, try to reuse the IEs introduced for IAB features as much as possible. * Option 4:   - Support both F1 and Xn for resource coordination, introduce WAB specific procedures in XnAP and F1AP. All resource multiplexing features introduced for IAB are applied to WAB unless not applicable.  Multi hop prevention  RAN3 to confirm supporting Solution 3, and send a LS to RAN2 to start the spec work on supporting the spec-based solution.  RAN3 assumes that supporting cell barring based on the new indicator in SIB is an optional capability for WAB-MT, which means:  • WAB-MTs with Rel-19 UE capability can read the new indicator in SIB to avoid to access WAB node  • WAB-MTs without this UE capability (e.g., with only Rel-15~Rel-18 UE capabilities) can avoid multi-hop based on implementation  Ericsson, Qualcomm, Nokia: do not agree  Huawei: Solution 1 cannot be accepted by operators, hence the need of solution 3  CATT: Solution 1 can work in some cases but there is a problem of resource availability with solution 1, hence Solution 3 is needed.  Ericsson: there is a multitude of solutions that dop not require impact on SIB1. Solution 1 was discussed as an implementation solution, while Solution 3 is kept as astandar dspecific solution, hence the proposed agreement is not a compromise  QC: it is too early to state there is a deployment problem, as we do not have any WAB deployed. It is out of RAN3 scope to decide if the capability of a UE is mandatory or optional  Nokia: each solution has pros and cons. We should not repeat discussions. We should consider the impact on chipsets. Can we evaluate if there is any disadvantage with solution 1?  Samsung: support Huawei and CATT.  Huawei: changes to SIB1 and UE capabilities are within the scope of RAN2. But we need Solution 3 as there are concerns on how Solution 1 can work  China Telecom: support Huawei and CATT. Solution 1 only applies to stationary scenario.  Qualcomm: solution 1 applies to mobile scenarios as well  DoCoMo: Solution 1 is workable but it is not easy to operate. In real commercial networks the solution is hard to make work. The only obstacle to Solution 3 is the Uu impact  Qualcomm: Solution 1 is not only based on PCI, it is also based on other parameters. In WAB out of band operation for the WAB gNB and the BH gNB is the best way to operate. Hence it would not be possible for the MT to connect to the WAB gNB. So for out of band there is no issue. For in band operations the MT does not only need to connect only to BH gNBs but also to BH gNBs that support resource coordination. The question is how an MT figures out how a gNB supports resource coordination or not. To solve this problem, we need some way of understand such capability, which could be the same identifiers used for Solution 1. Solution 3 is not needed for out of band and it does not fix problems with in band  Huawei: the comments from Qualcomm does not relate to the problem discussed  Proposal 3: No further discussion on WAB multihop topology prevention in Rel-19.( R3-253131)  There is no consensus on accepting solution 3 in RAN3  **CB: # WAB**  **- Discuss the open points captured**  **- Discuss on possible LS to RAN1 and RAN2**  **- Discuss whether there is a need to reply to the LS from SA2 on multihop**  **- Agree to TPs if needed**  (moderator - DoCoMo)  Summary of offline disc R3-253789 | | |