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

 XXXX

# 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%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_128%5CDocs%5CR3-253013.zip) | Reply LS on FS\_VMR\_Ph2 solution impacts to RAN (Additional ULI) (SA2(Qualcomm)) | LS inNoted |
| [R3-253018](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_128%5CDocs%5CR3-253018.zip) | Reply LS on MWAB-gNB Configurations (SA2(Qualcomm)) | LS inNoted |
| [R3-253019](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_128%5CDocs%5CR3-253019.zip) | Reply LS on PWS enhancement for MWAB and MBSR (SA2(Ericsson)) | LS inNoted |
| [R3-253390](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_128%5CDocs%5CR3-253390.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%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_128%5CDocs%5CR3-253168.zip) | Remaining aspects of WAB (Qualcomm Inc.) | discussion |
| [R3-253132](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_128%5CDocs%5CR3-253132.zip) | WAB-Node Resource Coordination (Ericsson) | discussion |
| [R3-253414](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_128%5CDocs%5CR3-253414.zip) | Way Forward On Multi-hop Prevention for WAB (China Telecom, CATT, Huawei, DoCoMo, Lenovo, Samsung, NEC) | discussion |
| [R3-253131](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_128%5CDocs%5CR3-253131.zip) | (TP for WAB BL CR for TS 38.401): Functional Aspects of WAB-Nodes (Ericsson, Jio Platforms) | other |
| [R3-253169](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_128%5CDocs%5CR3-253169.zip) | WAB radio resource coordination (Qualcomm Inc.) | discussion |
| [R3-253170](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_128%5CDocs%5CR3-253170.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%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_128%5CDocs%5CR3-253175.zip) | Further consideration on support of WAB (LG Electronics) | discussion |
| [R3-253176](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_128%5CDocs%5CR3-253176.zip) | (TP to TS 38.401, 38.413 and 38.423) TP for WAB support (LG Electronics) | other |
| [R3-253211](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_128%5CDocs%5CR3-253211.zip) | (TP to BL CR of 38.423 on WAB) Discussion on access and reliability for WAB (NEC) | other |
| [R3-253223](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_128%5CDocs%5CR3-253223.zip) | Remaining aspects for the support of WAB (CANON Research Centre France) | discussion |
| [R3-253301](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_128%5CDocs%5CR3-253301.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%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_128%5CDocs%5CR3-253302.zip) | (TP for BLCR to 38.401) On support of WAB (CATT) | other |
| [R3-253303](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_128%5CDocs%5CR3-253303.zip) | (TP for BLCRs to 38.423, 38.473) On resource coordination and Xn management for WAB (CATT) | other |
| [R3-253320](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_128%5CDocs%5CR3-253320.zip) | (TP to BL CR 38.423) Architecture and configuration for WAB-node (Lenovo) | other |
| [R3-253321](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_128%5CDocs%5CR3-253321.zip) | (TP to BL CR 38.423) Radio resource configuration for WAB-node (Lenovo) | other |
| [R3-253344](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_128%5CDocs%5CR3-253344.zip) | (TPs for WAB BL CRs) Architecture, Access Control and Additional ULI for WAB (Huawei) | other |
| [R3-253345](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_128%5CDocs%5CR3-253345.zip) | (TP for WAB BL CRs) Radio Resource multiplexing Coordination for WAB-node (Huawei) | other |
| [R3-253391](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_128%5CDocs%5CR3-253391.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%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_128%5CDocs%5CR3-253404.zip) | (TP to 38.413, 38.401) Discussion on remaining issues for support of WAB (ZTE Corporation) | other |
| [R3-253412](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_128%5CDocs%5CR3-253412.zip) | Discussion on Wireless Access Backhaul (NTT DOCOMO INC.) | discussion |
| [R3-253415](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_128%5CDocs%5CR3-253415.zip) | RAN2 impact of WAB (China Telecom) | discussion |
| [R3-253537](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_128%5CDocs%5CR3-253537.zip) | (TP to 38.423 38.473) Supporting resource coordination in WAB (ZTE Corporation) | other |
| [R3-253635](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_128%5CDocs%5CR3-253635.zip) | (TP to BLCR for TS 38.410) Discussion on WAB mobility (Samsung) | discussion |
| [R3-253636](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_128%5CDocs%5CR3-253636.zip) | Discussion on the left issues for WAB (Samsung) | discussion |
| [R3-253760](file:///C%3A%5CUsers%5C5088196%5CDownloads%5CInbox%5CR3-253760.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 togetherEricsson: We can take the proposals one by oneNokia, Qualcomm, ZTE: agree to merge the two proposals into oneLenovo: the information needs to be also sent to the neighbour gNBIt is possible to establish an Xn connection between two WAB-gNBs. It is possible to prevent establishment of such connectionsSamsung: the objective of the WID is to avoid Xn connecitons between WAB gNBsEricsson: we should discuss solutions for preventing such connecitons but that does not forbid to establish the connectionQC: we have tools to identify that an Xn connection is established between two WAB gNBs, hence we can prevent such connecitonsSamsung: we should deprioritize this issue Huawei: preventing Xn establishment should be possible but is not mandatoryNokia: prevention is ensured by means of standardised mechanismsCanon: it is beneficial to allow Xn connections between WAB gNBsTo be continued:The WAB-gNB should be notified about the target BH-gNB before the WAB-MT HONokia: 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 skippedHuawei: 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 scopeSamsung: The WID has the proposal in scope. CATT: not necessary to support this enhancement. Without it there is no issue, legacy procedures are enoughHuawei: Important for Xn management as a WAB node can move and providing TNL addresses saves time foir Xn establishmentQualcomm: it is not urgent to tackle this issue. There are legacy solutions to solve the problemNokia: 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 CoordinationAdopt 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 IABCATT: agree with QC and Huawei. We should not restrict what already agree for IAB, otherwise the topic will have to be reopened in RAN1Ericsson: 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 splitSamsung, Lenovo: agree with QC, Huawei and ZTE. Only supporting time domain is restrictiveNokia: suggest to start with time domain support, i.e. TDDEricsson: limiting to TDD is not restrictive. Copying resource coordination solutions from IAB is not efficient, as it creates many options and complexityQualcomm, Huawei: to be left to RAN1 whether indication of soft resources should be supportedZTE: we might not have time in case RAN1 replies that an indication for soft resources is neededSamsung: 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 indicationHuawei: we agree with an indication of hard/not available resource allocation, as this is the same for IABQualcomm: 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 preventionRAN3 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 implementationEricsson, Qualcomm, Nokia: do not agreeHuawei: Solution 1 cannot be accepted by operators, hence the need of solution 3CATT: 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 compromiseQC: 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 optionalNokia: 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 workChina Telecom: support Huawei and CATT. Solution 1 only applies to stationary scenario. Qualcomm: solution 1 applies to mobile scenarios as wellDoCoMo: 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 impactQualcomm: 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 bandHuawei: the comments from Qualcomm does not relate to the problem discussedProposal 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 |