**3GPP TSG-RAN WG3 Meeting #129R3-255789**

**Bengaluru, Karnataka, India, August 25th – 29th 2025**

Agenda Item: 12.2

Source: Ericsson, Jio Platforms

Title: (TP for WAB BL CR for TS 38.401): Functional Aspects of WAB-Nodes

Document for: Agreement

# Introduction

The present TP captures the agreements from the RAN3#129 online discussion:

**Add Note to BLCR 38.401: using SeGW for authorization is out of scope of this specification.**

**Single-gNB solution for WAB-gNB mobility with change of UE’s AMF is not supported in Rel-19.**

**ng-eNB is not supported for BH-RAN, change “BH-RAN node” to “BH-gNB” everywhere.**

**This release does not specify any signalling for Resource coordination between WAG nodes access and BH link. Any previous agreements on resource coordination are obsolete. Update the stage2 spec accordingly.**

**Proposal: Agree the TP for WAB BL CR for TS 38.401, provided below.**

# TP for WAB BL CR for TS 38.401

-------------------------------------------Start of changes-------------------------------------------

3 Definitions and abbreviations

3.1 Definitions

For the purpose of the present document, the terms and definitions given in TR 21.905 [1] and the following apply.
A term defined in the present document takes precedence over the definition of the same term, if any, in TR 21.905 [1].

**AI/ML Model Inference:** follows the definition of “AI/ML inference” as specified in clause 3.1 of TS 28.105 [34].

**AI/ML Model Training:** follows the definition of “ML model training” as specified in clause 3.1 of TS 28.105 [34].

**Associated QoS Flow:** as defined in TS 23.247 [27].

**Associated QoS flow information:** Information encompassing: QoS flow QoS parameters for associated QoS flows and mapping information between mapped (unicast) QoS flows and associated QoS flows. The respective information is included in a way that non-supporting RAN nodes would not establish respective RAN resources irrespective the multicast session state.

**BH-5GC:** The 5GC serving the WAB-MT.

**BH-AMF**: The AMF serving the WAB-MT.

**BH-gNB:** The gNB serving the WAB-MT.

**BH-gNB**: The gNB serving the WAB-MT.

**BH-UPF**: The UPF serving the WAB-MT for backhauling.

**Boundary IAB-node:** anIAB-node with one RRC interface terminating at a different IAB-donor-CU than the F1 interface. This definition applies to partial migration, inter-donor redundancy and inter-donor RLF recovery.

>>>>>>>>>>>>>>>>>>Unchanged parts are skipped<<<<<<<<<<<<<<<<<<

**U2N Relay UE:** as defined in TS 38.300 [2].

**U2N Remote UE:** as defined in TS 38.300 [2].

**WAB-gNB:** The gNB functionality of a WAB-node that provides NR access interface towards the UE. The gNB functionality is defined in TS 38.300 [2].

**WAB-MT:** The WAB-node’s function that terminates the Uu interface to the BH-gNB using the procedures and behaviours specified for UEs. Corresponds to the MWAB-UE function defined in TS 23.501 [3].

**WAB-node:** An NG-RAN node comprising the WAB-MT and the WAB-gNB functionality.

3.2 Abbreviations

For the purposes of the present document, the terms and definitions given in TR 21.905 [1] and the following apply.
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5GC 5G Core Network

>>>>>>>>>>>>>>>>>>Unchanged parts are skipped<<<<<<<<<<<<<<<<<<

OAM Operation, Administration and Maintenance

PLMN Public Land Mobile Network

>>>>>>>>>>>>>>>>>>Unchanged parts are skipped<<<<<<<<<<<<<<<<<<

SDT Small Data Transmission

SeGW Security Gateway

SFN System Frame Number

>>>>>>>>>>>>>>>>>>Unchanged parts are skipped<<<<<<<<<<<<<<<<<<

UL Uplink

ULI User Location Information

WAB Wireless Access Backhaul

-------------------------------------------Next change-------------------------------------------

6 NG-RAN architecture

6.1 Overview

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6.1.x Wireless Access Backhaul architecture

A WAB-node consists of a WAB-gNB and a WAB-MT. The WAB-gNB is based on the gNB functionality specified in TS 38.300 [2] and serves UEs by means of a terrestrial NR Uu radio link.

The WAB-MT is served by a BH-gNB. The WAB-gNB traffic, including NG, Xn and OAM traffic is transported via backhaul PDU session(s) of the WAB-MT.

NOTE: The use of other types of backhaul, e.g. non-3GPP backhaul, is up to implementation.

The WAB-gNB and the WAB-MT may connect to the same PLMN or to different PLMNs.

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X Wireless Access Backhaul

X.1 WAB-node integration procedure



**Figure X.1-1: WAB-node integration procedure**

**Phase 1: WAB-MT setup.** The WAB-MT of a WAB-node connects to the network in the same way as a UE by performing RRC connection setup procedure with the BH-gNB. The WAB-MT then performs, authorization and authentication with the BH-5GC. After the WAB-MT is authorized, the WAB-MT can establish one or more PDU sessions for backhauling.

**Phase 2: WAB-gNB setup.** This phase includes the following 3 sub-phases:

**Sub-phase 2-1: WAB-gNB initialization.** In this phase, the WAB-gNB is configured by the OAM (e.g., with the information needed to establish NG connections towards one or more AMF(s) and the WAB-gNB is service-authorized by the SeGW or by the OAM.

NOTE: The use of SeGW for authorization is out of scope of this specification.

**Sub-phase 2-2: NG connection setup.** The WAB-gNB establishes NG connection(s) toward the AMF(s). This step follows legacy procedures. After the NG is set up, the WAB-gNB can start serving UE(s).

**Sub-phase 2-3: Xn connection setup.** If needed, the WAB-gNB can establish Xn connection(s) towards the BH-gNB and/or other NG-RAN node(s). If the WAB-gNB includes a WAB-MT identifier in the signalling for Xn connection setup, the BH-gNB and/or other NG-RAN node(s) can understand that the peer node is the WAB-gNB of the WAB-node.

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X.4 WAB-node authorization

WAB-node authorization includes authorization of the WAB-MT’s backhaul support, and service authorization of the WAB-gNB, as defined in TS 23.501 [3].

Authorization of the WAB-MT is different from the service authorization of the WAB-gNB.

Authorization of the WAB-MT is defined in TS 23.501 [3].

Authorization of the WAB-gNB provides the service authorization, i.e., the right to serve UEs.

When the WAB-gNB’s service authorization status changes from “authorized” to “not authorized”:

1. The WAB-gNB attempts to handover, or releases, the UEs.
2. The NG and Xn connections of the WAB-gNB are removed.
3. The PDU sessions of the WAB-MT used for backhauling may be released.

It is expected that WAB-MT’s PLMN/SNPN ensures that backhaul PDU sessions of the WAB-MT are maintained long enough for the WAB-gNB to perform UE handover/release and the removal of NG and Xn connections, as specified in TS 23.501 [3].

Once the WAB-node’s service authorization status changes from “not authorized” to “authorized”, the WAB-gNB can establish connections to the SeGW, the OAM, the AMF(s) and, optionally, towards the BH-gNB and neighbouring NG-RAN nodes.

>>>>>>>>>>>>>>>>>>Unchanged parts are skipped<<<<<<<<<<<<<<<<<<

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X.7 WAB-node mobility

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X.7.2 WAB-gNB mobility

X.7.2.1 WAB-gNB mobility with change of UE’s AMF(s)

Due to the WAB-gNB’s mobility, the UEs moving together with the WAB-gNB may have to change AMF.

For the AMF change, a new logical WAB-gNB is instantiated, which establishes NG connection(s) towards one or more new AMF(s). The new logical WAB-gNB may obtain from the OAM the configuration parameters needed to establish the connection(s) to the UE’s new AMF(s), based on, e.g., WAB-node’s location.

The new logical WAB-gNB may activate one or more cell(s) with new TAC, cell ID, and PCI, which depend on the WAB-node’s current location.

The UEs are handled as follows:

* A UE in RRC\_CONNECTED state is handed over from a cell served by the old logical WAB-gNB to a cell served by the new logical WAB-gNB via NG-based handover with AMF relocation, as defined in TS 23.502 [7], after which the UE’s AMF is changed to the new AMF.
* A UE in RRC\_IDLE or RRC\_INACTIVE state camping on a cell served by the old logical WAB-gNB reselects a cell served by the new logical WAB-gNB. The reselection may be triggered by the removal of the old logical WAB-gNB’s cells from service. After cell reselection, the UE performs a Mobility Registration Update as defined in TS 23.502 [7], which is triggered by the new TAC broadcasted by the new logical WAB-gNB’s cell. During this Mobility Registration Update, the UE’s AMF is changed to the new AMF.

After all the UEs in RRC\_CONNECTED state are handed over, the NG connection(s) between the WAB-node and the old AMF(s) are removed via NG Removal procedure and the old logical WAB-gNB’s cell(s) are removed from service.

X.8 Xn interface of WAB-nodes

A WAB-gNB can establish an Xn connection with the BH-gNB serving the co-located WAB-MT, and with the neighbouring gNBs. During setup or update of its Xn connections, the WAB-gNB can include an ID of the WAB-MT, to indicate it is a WAB-gNB. In case the peer gNB is the WAB-MT’s BH-gNB, the WAB-MT ID makes the BH-gNB aware of the co-location of the WAB-MT and the WAB-gNB. The WAB-MT’s ID consists of the C-RNTI assigned to the WAB-MT by the BH-gNB and the cell ID of BH-gNB´s cell serving the WAB MT.

Xn connections between two WAB-gNBs can be avoided. To achieve this, the WAB-gNB may reject the Xn setup initiated by another WAB-gNB, e.g., based on the WAB-MT’s ID received in the XN SETUP REQUEST message.

Whether the setup of Xn connections between WAB-gNBs and BH-gNBs and between two WAB-gNBs is allowed or precluded can be, e.g., configured by the OAM.

-------------------------------------------End of changes-------------------------------------------