**3GPP TSG-RAN WG3 Meeting #129bisR3-257261**

**Prague, Czech Republic, 13 – 17 October 2025**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **38.401** | **CR** | **0493** | **rev** | **1** | **Current version:** | 19.0.0 |  |
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| *For* ***[HE](http://www.3gpp.org/3G_Specs/CRs.htm" \l "_blank)******[LP](http://www.3gpp.org/3G_Specs/CRs.htm" \l "_blank)*** *on using this form: comprehensive instructions can be found at  <http://www.3gpp.org/Change-Requests>.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network | **X** | Core Network |  |

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| ***Title:*** | Corrections for WAB | | | | | | | | | |
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| ***Source to WG:*** | ZTE Corporation, Ericsson, Jio Platforms, Nokia, Nokia Shanghai Bell, Samsung, Qualcomm | | | | | | | | | |
| ***Source to TSG:*** | R3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_WAB\_5GFemto-Core | | | | |  | ***Date:*** | | | 2025-10-16 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-19 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | 1. The “BH-AMF” has not been used, suggest to remove the definition. 2. In the Figure 6.1.7-1, the backhaul PDU Session(s) may also be used for transporting of Xn-C/Xn-U traffic, but this is missing in the line description. 3. It was agreed that the Additional ULI can be included in both UE-associated signalling and non-UE associated signalling. However, in clause 12.5, only the case that there is UE served by the WAB-gNB is mentioned, the non-UE associated case is not been covered. In SA2 spec as shown below, it referred to TS 38.401 for non-UE associated case. So, it is suggested to change the title to emphasize the Additional ULI and to capture the non-UE associated case as well.  |  | | --- | | TS 23.501:  The MWAB-gNB indicates the Additional ULI to AMF(s) it connects to by NG Setup and RAN Configuration Update procedures as specified in TS 38.401 [42]. |  1. The WAB-gNB has same functionality as the gNB defined in TS 38.300, which can support network sharing. When the WAB-gNB is shared, it can broadcast multiple PLMNs/SNPNs (e.g. PLMN A and B). For a specific UE from PLMN A, it is unclear which PLMN/SNPN is used in AULI. E.g. in case the WAB-gNB sends the AULI related to PLMN B, the UE’s CN (PLMN A) cannot use the AULI since it does not have the information of PLMN B. 2. A WAB node includes a WAB-gNB and a WAB-MT. The NG connection can be established between the WAB-gNB and the AMF(s). When the UE’s AMF is changed due to the WAB-gNB’s mobility, after all the UEs in RRC\_CONNECTED state are handed over, the NG connection(s) between the old logical WAB-gNB and the old AMF(s) should be removed, rather than the NG connection(s) between the WAB-node and the old AMF(s). 3. In clause 12.8, the first sentence may cause misunderstanding that the WAB-MT is co-located with the BH-gNB. Suggest to make it clear. And some editorial changes to keep align with stage 3. 4. The specification does not capture the fact that a BH-gNB may be configured with respect to whether it should accept Xn setup requests from WAB-gNBs. In some networks, the operator may want to prevent a BH-gNB and other static gNBs to establish Xn connections with WAB-gNBs, because such a connection will likely be short-lived due to WAB-node movement. On the other hand, for nomadic WAB-nodes, an operator may want to allow Xn setup between WAB-gNBs and static gNBs, given that it facilitates UE HO between the WAB-gNB and static gNBs. 5. Several wording and interpunction errors. | | | | | | | | |
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| ***Summary of change:*** | | 1. In clause 3.1, remove the definition of “BH-AMF”. 2. Modify the Figure 6.1.7-1:   - change the sentence “Backhaul PDU Session(s) for transporting of NG-C/NG-U interface traffic of WAB-gNB” to “Backhaul PDU Session(s) for transporting of NG/Xn/OAM traffic of WAB-gNB”.   1. In clause 12.5, change the title to “Additional User Location Information for WAB”, and capture that the WAB-gNB can indicate the Additional ULI to the core network by NG Setup and RAN Configuration Update procedures. 2. In clause 12.5, clarify the PLMN/SNPN in AULI is the UE’s serving PLMN/SNPN. 3. In clause 12.7.1, revise the description of ‘the NG connection(s) between the WAB-node and the old AMF(s)’ as ‘the NG connection(s) between the old logical WAB-gNB and the old AMF(s)’. 4. In clause 12.8, some editorial change to make the spec more clear. 5. In clause 12.8, added the statement that a BH-gNB may be configured with respect to whether it should accept Xn setup requests from WAB-gNBs, i.e. change “WAB-gNB” to “(WAB-)gNB”. 6. Several wording and interpunction corrections. | | | | | | | | |
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| ***Consequences if not approved:*** | | The specification remains mistakes. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 3.1, 6.1.7, 12.1, 12.2.1, 12.2.2, 12.2.3, 12.3, 12.5, 12.7.1, 12.7.2.1, 12.8 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

***----------------Start of the First Change---------------***

## 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-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<<<<<<<<<<<<<<<<<<

***-----------------Next Change-------------------***

### 6.1.7 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.

Figure 6.1.7-1 shows the WAB architecture for 5GS.



Figure 6.1.7-1: The WAB architecture

In in-band scenarios, backhaul and access of the WAB-node use terrestrial radio links. In out-of-band scenarios, the backhaul can use a terrestrial or a non-terrestrial radio link, while the access uses terrestrial radio link.

NOTE: The in-band operation of WAB-node can be supported by implementation.

The WAB-MT may connect to a public PLMN or an SNPN.

The WAB-gNB may connect to a public PLMN or an SNPN.

Figure 6.1.7-2 shows protocol stacks for NG Control plane and NG User plane transport via the wireless backhaul.



Figure 6.1.7-2: Protocol stacks for NG Control plane and NG User plane transport

Figure 6.1.7-3 shows protocol stacks for Xn Control plane and Xn User plane transport for WAB-node.



Figure 6.1.7-3: Protocol stacks for Xn Control plane and Xn User plane transport

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12 Wireless Access Backhaul

12.1 WAB-node integration procedure

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**Figure 12.1-1 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:

**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.

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

**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 a WAB-node.

12.2 Configuration of WAB-node

12.2.1 General

The following configurations of a WAB-node may need to be updated as the node moves:

- The parameters that enable the WAB-gNB to select and connect to the AMF(s) that serve the UE(s).

- The parameters that enable the WAB-gNB to connect to, and communicate with, the OAM system.

- The parameters that the WAB-gNB should broadcast, e.g., the TAC(s), the cell ID(s), the RANAC(s).

A WAB-node may be provisioned with the parameters pertinent to different potential locations of the WAB- node. Alternatively, the OAM can provision configuration parameters to the WAB-node, based on the location of the node. In that case, the continuity of OAM connectivity needs to be ensured as the WAB-node moves.

12.2.2 IP address configuration for the WAB-gNB

A WAB-MT obtains IP address(es) for its PDU sessions in the same manner as a legacy UE.

The IP address(es) of the WAB-MT can be used for the backhauling of WAB-gNB’s NG, Xn and OAM traffic. In case the WAB-gNB uses the IPsec tunnel mode to protect the OAM, NG and/or Xn traffic, the IP address(es) of the WAB-MT is used as outer IP address(es). The allocation of the inner tunnel IP address(es) is outside of 3GPP scope.

12.2.3 TAC and RANAC (re-)configurations for a WAB-gNB’s cell

The TAC and RANAC of WAB-gNB’s cell are configured by the OAM. During the mobility of WAB-node, they can be reconfigured by the OAM, or they can remain unchanged in a certain geographical area. The TAC and RANAC of the WAB-gNB’s cell may be the same as, or different than, the TAC and RANAC of the co-located WAB-MT’s serving cell, respectively. The TAC and RANAC broadcasted of the WAB-gNB’s cell can be changed in order to reflect the WAB-node’s physical location.

***-----------------Next Change-------------------***

## 12.5 Additional User Location Information for WAB

For UEs served by a WAB-gNB, in addition to the User Location Information (ULI), the WAB-gNB also provides the core network with Additional ULI, which includes a TAI and a NR CGI pertinent to the UE’s serving PLMN/SNPN.

If the UE’s serving PLMN/SNPN is the same as the PLMN/SNPN serving the WAB-MT, and the WAB-MT connects to the BH-gNB by means of a terrestrial link, the Additional ULI for UEs served by the WAB-gNB includes the TAI and the NR CGI of the cell serving the WAB-MT.

If the PLMN/SNPN serving the WAB-MT is different from the UE’s serving PLMN/SNPN, and the WAB-MT connects to the BH-gNB by means of a terrestrial link, the Additional ULI for UEs served by the WAB-gNB is determined by the WAB-gNB, based on the WAB-node’s geo-location.

If the WAB-MT connects to the BH-gNB by means of a non-terrestrial link, the Additional ULI for UEs served by WAB-gNB is determined by the WAB-gNB, based on WAB-node’s geo-location. This applies regardless of whether the PLMN/SNPN serving the WAB-MT is the same as, or different than, the UE’s serving PLMN/SNPN.

In case Additional ULI for UEs served by a WAB-gNB changes, e.g., due to WAB-node movement, the WAB-gNB derives the new Additional ULI and reports it via legacy procedures, if required by the core network.

The WAB-gNB can indicate the Additional ULI to the core network via the NG Setup and RAN Configuration Update procedures.

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12.7 WAB-node mobility

12.7.1 WAB-MT mobility

The WAB-MT reuses legacy mobility procedures defined for the UE. During the WAB-node’s movement, when the BH PDU session(s) of WAB-MT are re-established, the co-located WAB-gNB may need to update the IP address(es) used for its traffic. In case IPsec tunnel mode is used to protect the WAB-gNB’s traffic, MOBIKE (IETF RFC 4555 [29]) can be used to avoid the change of inner IP address(es) used for this traffic. Otherwise, the following procedures can be used for handling the IP address change of the WAB-gNB’s traffic:

- NG-C and Xn-C can be migrated to the new IP address(es) via legacy procedures defined in TS 38.412 [37] and TS 38.422 [38], respectively.

- NG-U GTP-U tunnels can be migrated via the legacy NGAP PDU Session Resource Modify Indication procedure.

The continuity of OAM connectivity of the WAB-gNB needs to be ensured as the WAB-node moves across the BH network.

12.7.2 WAB-gNB mobility

12.7.2.1 WAB-gNB mobility with change of UE’s AMF(s)

Due to the WAB-gNB’s mobility, the AMF serving the UEs served by the WAB-gNB may need to be changed.

For the AMF change, a new logical WAB-gNB is instantiated, and it 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 shall 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 [32], 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 [32], which is triggered by the new TAC broadcasted of 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 old logical WAB-gNB and the old AMF(s) are removed via NG Removal procedure, and the old logical WAB-gNB’s cell(s) are removed from service.

***-----------------Next Change-------------------***

## 12.8 Xn connection management

A WAB-gNB can establish an Xn connection with the BH-gNB serving the WAB-MT co-located with the WAB-gNB, and with the neighbouring gNBs. During the Xn setup or NG-RAN node configuration update, the WAB-gNB can include an ID of the co-located WAB-MT, to indicate that 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 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.

Establishment of 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 presence of the WAB-MT ID received in the XN SETUP REQUEST message.

A (WAB-)gNB should be configurable with respect to whether it should accept or reject Xn setup requests received from (WAB-)gNBs.

***-----------------End of the Last Change---------------***