3GPP TSG-RAN WG3 #124 R3-243844

Fukuoka, Japan, 20– 24 May 2024

Agenda Item: 12.2

Source: NTTDOCOMO (moderator)

Title: Summary of Offline Discussion on additional topological enhancement

Document for: Approval

# Introduction

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

**CB: # WAB**

* **Resolve the FFS captured above**
* **Converge on the TPs below, where agreements taken above will be captured. If any more agreements are taken, they can be included in the TPs below:**
  + **TP for Architecture (Nokia)**
  + **TP for Integration procedure (Huawei)**
  + **TP for Authorization (CATT)**
  + **TP for Mobility (Ericsson)**
  + **TP for miscellaneous issues (ZTE)**
    - **WAB configuration**
    - **Etc**
* **SA2 reply LS (Qualcomm)**

(Moderator – Docomo)

Summary of offline disc in R3-243844

# Discussion

## FFS issues

**Upon WAB-gNB mobility:**

**If needed, the WAB-gNB may power up one or more new cells with new configuration parameters related to its current location and handover UEs between the old and new cell served by the WAB-gNB.**

**FFS if this procedure is needed for AMF relocation.**

**Discuss whether in case this procedure is used for AMF relocation, new cells have to belong to different logical gNBs or can belong to the same gNB.**

**Q1. If needed, the WAB-gNB may power up one or more new cells with new configuration parameters related to its current location and handover UEs between the old and new cell served by the WAB-gNB. Is this needed for AMF relocation?**

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| Company | comments |
| ZTE | Yes, if AMF relocation is needed, intra-RAN node N2 based HO is performed between the old and new cells for the AMF relocation. |
| **Ericsson** | For example, it is needed when AMF relocation is accompanied by change of parameters that affect UE connectivity, such as TAC. The two may often go hand-in-hand. |
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**Q2. In case this procedure above is used for AMF relocation, whether new cells have to belong to different logical gNBs or can belong to the same gNB?**

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| Company | comments |
| ZTE | We think the new cells can belong to the same gNB. According to 23.502, the inter NG-RAN node N2 based handover procedure specified in clause 4.9.1.3 in 23.502 may also be used to change AMF for UEs for intra-NG-RAN node handover scenario when the source and target gNB are the same gNB. So currently we don’t see any issue if the new cells has the same gNB ID with the old cells. |
| **Ericsson** | In our understanding, if source and target UE’s AMF belongs to different AMF sets, a second logical WAB-gNB needs to be instantiated. |
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**Q3. Do you agree to capture the following text for IP address allocation for WAB-node in the TR 38.799:**

**4.3.x IP address allocation for WAB-node**

**A WAB-MT may obtain IP address(es) as a normal UE. The WAB-MT may deliver the allocated IP address(es) to the co-located WAB-gNB, which is used by the WAB-gNB for traffic exchange via the backhaul.**

**Alternatively, the WAB-gNB may obtain dedicated IP address(es) from operator. In this case, separate IP addresses are used by the WAB-gNB and co-located WAB-MT. In this case, a tunnel (e.g. based on IPsec or L2TP) could be established to transfer the WAB traffic by implementation. If a tunnel is established, a gateway may be deployed to terminate the tunnel.**

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| Company | comments |
| ZTE | Yes. We need to capture how IP address of WAB-gNB is allocated, which is used for OAM/NG/Xn traffic transfer.  There is some benefits for the WAB-gNB to use separate static/dedicated IP address rather than use the same IP address as WAB-MT. By using static/dedicated IP address, the IP address of the WAB-gNB can be maintained and doesn’t need to be re-allocated upon change of BH-UPF. In this case, the OAM connection, SCTP connection, NG/Xn connection don’t need to be re-established/updated upon change of BH-UPF. And the NG-U GTP-U tunnel doesn’t need to be redirected to be new IP address. Moreover, it is flexible to configure multiple IP addresses/prefixes in different domain for the WAB-gNB for different usages (e.g., OAM, CP/UP traffic) if the WAB-gNB doesn’t use the same IP address as WAB-MT.  Another potential solution is that the WAB-gNB may obtain its IP addresses anchored at BH-UPF via OAM. We suggest to capture all potential solutions in the TR and further discuss them and evaluate during next meeting.  **A WAB-MT may obtain IP address(es) as a normal UE. The WAB-MT may deliver the allocated IP address(es) to the co-located WAB-gNB, which is used by the WAB-gNB for traffic exchange via the backhaul. Or the WAB-gNB may obtain its IP addresses via OAM.**  **Alternatively, the WAB-gNB may obtain dedicated IP address(es) from operator. In this case, separate IP addresses are used by the WAB-gNB and co-located WAB-MT. In this case, a tunnel (e.g. based on IPsec or L2TP) could be established to transfer the WAB traffic by implementation. If a tunnel is established, a gateway may be deployed to terminate the tunnel.** |
| **Ericsson** | Yes, we have commented on the related TP in the present CB. |
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**Q4. Do you agree to capture in the TR 38.799 the following architecture and protocol stack as a potential option.**

**The WAB architecture for using dedicated IP addresses for WAB-gNB via tunnel when the WAB-gNB’s NG traffic is transported via PDU session backhaul is shown in Figure 3.**



**Figure 3: The WAB architecture example for 5GS using dedicated IP addresses for WAB-gNB when the WAB-gNB traffic is encapsulated in a tunnel and transported via PDU session backhaul**

**The corresponding protocol stack for NG-U and NG-C transport using layer 2 tunnel is shown in Figure 4.**



**Figure 4: The protocol stack for NG-U and NG-C transport using layer 2 tunnel**

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| Company | comments |
| ZTE | Yes. In our understanding, in study item phase, it’s open to discuss and capture all potential solutions which is in the scope of the SID. And then further down-selection or evaluation/recommendation can be made based on the potential solutions.  As discussed in Q3, we see benefits for the WAB-gNB to use static/dedicated IP address rather than use the same IP address as WAB-MT. If separate IP addresses are used for WAB-gNB and WAB-MT, a tunnel needs to established to transfer the BH traffic. In this case, it would be much more clear to capture the corresponding architecture and protocol stack in the TR, to let people understand how it works. |
| **Ericsson** | OK to capture. However, at least Fig.3 needs update to align with the newest agreed terminology and also with the format already used in the TR. |
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# Conclusion

# References

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| [R3-243021](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243021.zip) | LS on FS\_VMR\_Ph2 solution impacts to RAN (SA2(Qualcomm)) | LS in |
| [R3-243174](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243174.zip) | Discussion on Wireless Access Backhaul (NTTDOCOMO, INC.) | discussion |
| [R3-243199](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243199.zip) | (draft Reply LS) Discussion on reply LS to SA2 on VS\_VMR\_Ph2 solution impacts on RAN (Qualcomm Inc.) | other |
| [R3-243200](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243200.zip) | (TP to TR 38.799) WAB requirements and archtiecture (Qualcomm Inc.) | other |
| [R3-243201](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243201.zip) | (TP to TR 38.799) WAB network integration and mobility (Qualcomm Inc.) | other |
| [R3-243202](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243202.zip) | (TP to TR 38.799) WAB resource coordination (Qualcomm Inc.) | other |
| [R3-243217](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243217.zip) | (TP to TR 38.799) Discussion on architecture and protocol stack for R19 WAB (ZTE) | other |
| [R3-243218](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243218.zip) | (TP to TR 38.799) Discussion on supporting WAB and the reply LS on FS\_VMR\_Ph2 solution impacts to RAN (ZTE) | other |
| [R3-243219](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243219.zip) | (TP to TR 38.799) Discussion on WAB mobility and resource multiplexing (ZTE) | other |
| [R3-243247](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243247.zip) | Consideration on architecture and mobility for WAB (NEC) | discussion |
| [R3-243305](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243305.zip) | (TP for TR 38.799) General aspects of WAB (Xiaomi) | other |
| [R3-243306](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243306.zip) | (TP for TR 38.799) SA2’s LS for WAB (Xiaomi) | other |
| [R3-243327](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243327.zip) | (TP to TR 38.799) Discussion on impact of WAB (CATT) | other |
| [R3-243328](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243328.zip) | (draft reply LS) Discussion on LS for VMR from SA2 (CATT) | other |
| [R3-243329](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243329.zip) | (TP to TR 38.799) Discusson on resource multiplexing for WAB (CATT) | other |
| [R3-243339](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243339.zip) | Discussion on the Architecture, Access control and QoS support of WAB (Huawei) | pCR |
| [R3-243340](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243340.zip) | Discussion on the procedures related to the WAB (Huawei) | pCR |
| [R3-243341](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243341.zip) | Discussion on SA2's LS (S2-2405822/R3-243021) on FS\_VMR\_Ph2 solution impacts to RAN (Huawei) | discussion |
| [R3-243351](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243351.zip) | (TP to draft TR 38.799) Discussion on WAB architecture and high level aspects (Nokia, Nokia Shanghai Bell) | other |
| [R3-243352](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243352.zip) | Discussion on WAB integration and mobility (Nokia, Nokia Shanghai Bell) | discussion |
| [R3-243353](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243353.zip) | Resource Multiplexing for WAB (Nokia, Nokia Shanghai Bell) | discussion |
| [R3-243361](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243361.zip) | (pCR for TR 38.799) WAB Architecture and Scenarios (Ericsson) | pCR |
| [R3-243362](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243362.zip) | (pCR for TR 38.799) Functional Aspects of WAB-Nodes (Ericsson) | pCR |
| [R3-243363](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243363.zip) | Handling of Backhaul Link Degradation and Resource Multiplexing for WAB (Ericsson) | discussion |
| [R3-243389](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243389.zip) | Discussion on integration procedure for WAB node (Lenovo) | discussion |
| [R3-243390](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243390.zip) | Discussion on migration procedure for WAB node (Lenovo) | discussion |
| [R3-243391](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243391.zip) | Discussion on resource multiplexing for WAB node (Lenovo) | discussion |
| [R3-243581](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243581.zip) | Discussion on enhancements for WAB (CANON Research Centre France) | discussion |
| [R3-243583](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243583.zip) | Discussion on RAN impact of SA2 solution in WAB (LG Electronics) | discussion |
| [R3-243584](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243584.zip) | (TP for TR 38.799) Architecture and protocol stack for WAB’s Xn (LG Electronics) | other |
| [R3-243585](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243585.zip) | Reply LS on FS\_VMR\_Ph2 solution impacts to RAN (LG Electronics) | LS out To: SA2 CC: RAN2 |
| [R3-243588](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243588.zip) | Views on FS\_VMR\_Ph2 Solution Impacts to RAN (China Telecom) | discussion |
| [R3-243648](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243648.zip) | (TP to TR 38.799) Discussion on network integration for WAB (Samsung) | pCR |
| [R3-243649](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243649.zip) | (TP to TR 38.799) Discussion on WAB mobility (Samsung) | pCR |

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| [R3-243020](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243020.zip) | LS on Support of UE move between CAG cell of 5G Femto and CSG cell (SA2(Docomo)) | LS in |
| [R3-243025](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243025.zip) | LS to request clarification on the potential baseline system architecture of 5G NR Femto (SA3(China mobile)) | LS in |
| [R3-243175](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243175.zip) | Discussion on NR Femto (NTTDOCOMO, INC.) | discussion |
| [R3-243176](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243176.zip) | draft Reply LS on Support of UE move between CAG cell of 5G Femto and CSG cell (NTTDOCOMO, INC.) | LS out To: SA2 CC: RAN2 |
| [R3-243187](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243187.zip) | 5G femto architecture considerations (AT&T Services, Inc.) | discussion |
| [R3-243197](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243197.zip) | Comment on Femto architecture options 1 and 2 (Charter Communications, Inc) | other |
| [R3-243198](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243198.zip) | Xn Gateway in Femto architecture (Charter Communications, Inc) | discussion |
| [R3-243203](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243203.zip) | (draft Reply LS) Discussion on reply LS to SA2 on Support of UE move between CAG cell of 5G Femto and CSG cell (Qualcomm Inc.) | other |
| [R3-243232](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243232.zip) | Access to local services from the 5G Femto via distributed UPF (Huawei) | pCR |
| [R3-243252](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243252.zip) | Open issues on NR femto (NEC) | discussion |
| [R3-243315](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243315.zip) | Discussion on NG connection and interface for Option 2 for NR Femto Architecture (Baicells) | discussion |
| [R3-243316](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243316.zip) | (TP to TR 38.799)NG connection and interface for Option 2 for NR Femto Architecture (Baicells) | discussion |
| [R3-243330](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243330.zip) | (TP to TR 38.799) On 5G Femto architecture (CATT) | other |
| [R3-243331](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243331.zip) | (TP to TR 38.799) On 5G Femto local service access (CATT) | other |
| [R3-243332](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243332.zip) | (TP to TR 38.799) On 5G Femto access control mechanism (CATT) | other |
| [R3-243342](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243342.zip) | Discussion on the architecture and access control for NR Femto (Huawei) | pCR |
| [R3-243343](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243343.zip) | Discussion on SA2’s LS (S2-2405813/ R3-243020) on Support of UE move between CAG cell of 5G Femto and CSG cel (Huawei) | discussion |
| [R3-243374](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243374.zip) | NR Femto Architecture and Ongoing Issues (Ericsson LM) | pCR |
| [R3-243392](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243392.zip) | Architecture for NR Femto (Lenovo) | discussion |
| [R3-243393](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243393.zip) | Access control and handover for NR Femto with CAG (Lenovo) | discussion |
| [R3-243394](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243394.zip) | Discussion on interworking between CAG and CSG cells (Lenovo) | discussion |
| [R3-243409](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243409.zip) | NR Femto Node Access Control with CAG (Ericsson LM) | pCR |
| [R3-243411](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243411.zip) | Access to Local Services via Local UPF (Ericsson LM) | pCR |
| [R3-243562](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243562.zip) | [TP for TR 38.799] Evaluation of NR Femto Architecture Options (Nokia, TMO US, AT&T, Verizon Wireless, KDDI, British Telecom, NTT Docomo Charter) | other |
| [R3-243563](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243563.zip) | Support of UE Move between CAG cell and CSG cell (Nokia) | discussion |
| [R3-243564](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243564.zip) | Reply LS on Support of UE move between CAG cell of 5G Femto and CSG Cell (Nokia) | LS out To: SA2 CC: |
| [R3-243565](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243565.zip) | [TP for TR 38.799] Access to Local Services (Nokia ) | other |
| [R3-243586](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243586.zip) | Discussion on SA2 solutions to support HO between CAG and CSG cell (LG Electronics) | discussion |
| [R3-243587](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243587.zip) | Reply LS on Support of UE move between CAG cell of 5G Femto and CSG cell (LG Electronics) | LS out To: SA2, RAN2 CC: |
| [R3-243607](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243607.zip) | On Access Control for NR Femto (China Telecom) | discussion |
| [R3-243608](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243608.zip) | On Architecture for NR Femto Support (China Telecom) | discussion |
| [R3-243650](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243650.zip) | (TP to TR 38.799) Discussion on Femto architecture (Samsung) | pCR |
| [R3-243651](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243651.zip) | (TP to TR 38.799) Discussion on access control for NR Femto (Samsung) | pCR |
| [R3-243686](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243686.zip) | draft Reply LS to request clarification on the potential baseline system architecture of 5G NR Femto (NTTDOCOMO, INC.) | LS out To: SA3 CC: SA2 |
| [R3-243753](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243753.zip) | (TP to TR 38.799)Discussion on architecture and access control of NR Femto (ZTE) | discussion |
| [R3-243754](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243754.zip) | (TP to TR 38.799)Discussion on support of local services (ZTE) | discussion |
| [R3-243755](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243755.zip) | Discussion on CSG-CAG mobility (ZTE) | discussion |
| [R3-243761](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243761.zip) | Draft Reply LS to request clarification on the potential baseline system architecture of 5G NR Femto (CMCC) | LS out To: SA3 CC: SA2 |