**SA WG2 Meeting #164 S2-240xxxx**

**Maastricht, Netherlands, 19 August – 23 August, 2024 (revision of S2-24xxxxx)**

**Source: LG Electronics**

**Title: Discussion on MOCN support by MWAB**

**Document for: Discussion**

**Agenda Item: 19.6.2**

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*Abstract of the contribution: This paper discusses aspect on MOCN support by MWAB.*

# Discussion

TR 23.700-06 clause 8.1 "KI#1: Architectural enhancements for the support of a MWAB Conclusion" includes the following conclusion.

*- MOCN should be supported by MWAB-gNB.*

*NOTE 3: Whether any specification impact is needed for MOCN support can be decided in normative phase.*

Describing just "5G MOCN is supported by the MWAB-gNB." in TS 23.501 may not be sufficient to understand how this works.

S2-2406214 was submitted to SA2#163 to resolve the EN about MOCN support by MWAB in Solution#1 as below. We believe that it would be good to discuss the following resolution proposal to decide which case(s) can be taken into account or valid, i.e. case 1), case 2) or both cases, and to identify if there is any other case. Based on the decision, corresponding description can be captured in TS 23.501.

Example scenarios are as below for case 1) and case 2):

Case 1)

- A MWAB-gNB is shared by 3 PLMNs, i.e. PLMN#1, PLMN#2 and PLMN#3.

- There are 3 MWAB-UEs in the MWAB where each MWAB-UE belongs to each PLMN. That is, MWAB-UE#1 belongs to PLMN#1, MWAB-UE#2 belongs to PLMN#2 and MWAB-UE#3 belongs to PLMN#3.

- Each MWAB-UE in the MWAB connects and registers its BH network (e.g. PLMN#4), and establishes BH PDU Sessions.

- The MWAB-gNB connects to OAM server located in each PLMN it serves to obtain configuration for MWAB-gNB operation, this is,

- The MWAB-gNB connects to OAM server in PLMN#1 via MWAB-UE#1's BH PDU Session and obtains configuration for MWAB-gNB operation from the OAM server in PLMN#1.

- The MWAB-gNB connects to OAM server in PLMN#2 via MWAB-UE#2's BH PDU Session and obtains configuration for MWAB-gNB operation from the OAM server in PLMN#2.

- The MWAB-gNB connects to OAM server in PLMN#3 via MWAB-UE#3's BH PDU Session and obtains configuration for MWAB-gNB operation from the OAM server in PLMN#3.

Case 2)

- A MWAB-gNB is shared by 3 PLMNs, i.e. PLMN#1, PLMN#2 and PLMN#3.

- There is only one MWAB-UE in the MWAB where the MWAB-UE belongs to PLMN#1.

- The MWAB-UE in the MWAB connects and registers its BH network (e.g. PLMN#4), and establishes BH PDU Sessions.

- The MWAB-gNB connects to OAM server located in each PLMN it serves to obtain configuration for MWAB-gNB operation, this is,

- The MWAB-gNB connects to OAM server in PLMN#1 via the MWAB-UE's BH PDU Session and obtains configuration for MWAB-gNB operation from the OAM server in PLMN#1.

- The MWAB-gNB connects to OAM server in PLMN#2 via the MWAB-UE's BH PDU Session and obtains configuration for MWAB-gNB operation from the OAM server in PLMN#2.

- The MWAB-gNB connects to OAM server in PLMN#3 via the MWAB-UE's BH PDU Session and obtains configuration for MWAB-gNB operation from the OAM server in PLMN#3.

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| 6.1.2 Functional descriptions The MWAB operates as follows to provide service to a UE:  1. To operate as a MWAB, the MWAB-UE needs to first register to a serving network that is allowed by its subscription, and that is PLMN 1 in the architecture shown in clause 6.1.1. The serving PLMN authorizes the MWAB based on its subscription and provides the authorization result indication to the MWAB-UE.  2. MWAB-UE provides the authorization result indication to the MWAB-gNB, which may trigger the MWAB-gNB to attempt the connection with the PLMN it serves, i.e. PLMN 2 in the architectures shown in clause 6.1.1.  3. The attempt from the MWAB-gNB triggers the MWAB-UE to establishes a PDU session(s) for the MWAB operation, based on the configuration of the MWAB-UE, e.g. with the proper DNN, S-NSSAI, and the SSC Mode. Only IP based of PDU sessions are used for the MWAB operations support. The configuration of the MWAB-UE can be Local Configuration, or URSP rules.  4. The serving PLMN of MWAB-UE selects the proper MWAB UPF according to the DNN and S-NSSAI for the PDU session and ensures that the selected MWAB UPF provides the connection to the PLMN 2's AMF and UPF.  5. The MWAB-gNB establishes the connection to the OAM system of the PLMN 2 and obtains the corresponding configurations to operate as a gNB for PLMN 2. This includes for example the configuration on the AS layer operation, and also the information to be sent in the SIB, e.g. PLMN ID(s). Details of the configuration information are out of scope of SA2.  6. The MWAB starts to operate based on the OAM control as a gNB for PLMN 2, and serves the UE in proximity for PLMN 2. The MWAB-gNB may also instructed by the OAM system to establish N2 interface using the NG setup procedure defined in TS 38.413 [8] with some AMFs in PLMN 2 over the PDU session provided by MWAB-UE.  7. When a UE camps on the MWAB-gNB starts requests a connection, e.g. initiates a registration or service request procedure, the MWAB-gNB performs usual operation as specified in TS 23.501 [2] and route the message to a suitable UE AMF in PLMN 2. The AMF may be aware of that the UE is served by a MWAB based on the ULI information.  8. When the UE establishes a PDU session, the UE SMF selects a proper UE UPF. The MWAG-gNB may establish the N3 interface with the UPF over the PDU session of the MWAB-UE, if it is not yet established.  9. The UE served by the MWAB-gNB (of PLMN-2) is not aware of the serving PLMN of the MWAB-UE, and thus does not need a roaming agreement with the serving PLMN of the MWAB-UE.  To support MOCN RAN sharing, the following two cases can be considered. The operations of the MWAB-gNB are based on clause 5.18 of TS 23.501 [2].  1) A MWAB contains MWAB-UE part for each PLMN.  - The MWAB-UE for each PLMN (i.e. Each MWAB-UE subscribing to different PLMN) performs steps 1 to 4.  - The MWAB-gNB performs step 2 and steps 5 to 6 in order to operate as a gNB for each PLMN it serves.  2) A MWAB contains single MWAB-UE part for all PLMNs sharing the MWAB-gNB. It is assumed that this MWAB-UE subscribes to one of the PLMNs.  - The MWAB-UE performs steps 1 to 4.  - The MWAB-gNB performs step 2 and steps 5 to 6 in order to operate as a gNB for each PLMN it serves.  The efficient mobility and service continuity support for UE when the serving MWAB moves (KI#4) will be addressed in a separate solution compatible with this solution. |

# Proposal

It is proposed to discuss and decide which case(s) described above and/or any other possible case can be taken into account for normative work.