**SA WG2 Meeting #S2-154 S2-xxx**

**14 – 18 November, 2022, Toulouse, FR**

**Title:** Scope of resource efficiency for MBS reception in RAN sharing scenario

**Work Item/Release:** FS\_5MBS\_Ph2/Rel-18

**Document for: Discussion**

**Agenda Item: 9.18**

*Abstract of the contribution: This paper provides considerations related to the incoming LS S2-2210174.*

Introduction

SA2 received the incoming LS S2-2210174 related to the applicability of MOCN for MBS multicast from RAN plenary:

*TSG RAN considers that from technical point of view support of resource efficiency for MBS reception is beneficial regardless of the MBS session type (broadcast / multicast).*

*TSG RAN suggests RAN3 to focus on the work on the broadcast service for resource efficiency improvement for* ***MBS reception in RAN sharing scenario****, and to* ***further coordinate with SA2 on the applicability of the solution to multicast service when needed.***

*…*

*Action To SA2 and SA:*

*TSG RAN kindly asks SA2 and SA to take the above information into account for their further work and coordinate with RAN and RAN3 if needed.*

The SA2 SID [SP-211645](https://www.3gpp.org/ftp/tsg_sa/TSG_SA/TSGS_94E_Electronic_2021_12/Docs/SP-211645.zip) only contains an objective to study 5G MOCN network sharing for broadcast:

*WT#1.2 Study feasible and efficient resource utilization for the same broadcast content to be provided to 5G MOCN network sharing scenarios (i.e., multiple CNs are connected to the same NG-RAN);*

The related key issue 2 in TR 23.700-47 is also restricted to broadcast.

In contrast the RAN WID [RP-221458](https://www.3gpp.org/ftp/tsg_ran/TSG_RAN/TSGR_96/Docs/RP-221458.zip) on Enhancements of NR Multicast and Broadcast Services contains a broader objective applicable for MBS in general:

*Study and if necessary, specify enhancements to improve the resource efficiency for MBS reception in RAN sharing scenarios [RAN3]*

RAN3 was thus discussing whether to study MOCN for multicast.

The present contribution provides an initial assessment on technical impacts on MOCN network sharing for multicast and whether the proposed solution MOCN network sharing for broadcast in TR 23.700-47 can easily be applied to multicast.

Discussion

The following differences between MBS multicast and broadcast are relevant for MOCN network sharing and require study:

1. Most proposed solutions for MOCN network sharing suggest signalling enhancements to the MBS Session Start for Broadcast. The signalling enhancements are send from MB-SMF towards NG-RAN nodes in the first interaction related to the MBS sesssion to inform them that MOCN network sharing applies. This procedure is not applicable for muticast.

2. For multicast, the MBS session is set up in a completely different manner towards RAN nodes: Join requests from UE towards the SMF are the first step and a discussion is required what session ID the UE should use and whether and how the SMF needs to be aware that MOCN applies to an MBS session.

3. For broadcast, only the TMGI as MBS session ID is supported, but for multicast also a source specific IP multicast address is allowed. Some of the proposed solution for broadcast target special characteristics of the TMGI

4. For multicast, NG-RAN nodes determine the need to distribute an MBS session via the presence of UEs they serve in the MBS session. The NG-RAN node then interacts with the MB-SMF via the shared delivery establishment procedure. All those procedures are only applicable for multicast and potential enhancements need to be discussed.

5. Only for multicast, SMFs and NG-RAN nodes need to discover an MB-SMF serving an MBS session via the MBS session ID.

6. NG-RAN nodes may also be added to the multicast session via handover of UEs in the multicast session. Discussion is needed whether information about MOCN network sharing is the related procedures is required.

7. Multicast also has procedures to minimize packet loss during mobility of UEs in the multicast MBS session based on sequence numbers generated by the MB-UPF and it is unclear what to do in that respect if there are multiple MB-UPFs as source for the MBS data.

8. Unlike Broadcast, multicast MBS sessions may be activated and deactivated. Considerations on how to handle related signalling arriving at different times from different PLMNs and how to ensure that the MBS data are received at appropriate times are required.

For the urgency of the use cases on multicast MBS MOCN feedback from operators is requested. Obviously, RAN sharing is important. But MOCN network sharing goes one step further and also means shared MBS services offered by operators via the shared RAN.

Conclusions

**Introducing MOCN network sharing for multicast requires both study and normative work in SA2 and cannot be introduced by RAN3 alone. There are substantial technical differences compared to MOCN network sharing for broadcast.**