3GPP TSG RAN Meeting #93e RP-21xxxx

Electronic Meeting, Sept. 13 - 17, 2021

Agenda Item: 9.3.2.4

Source: 3GPP RAN1 WG Vice-Chair

Title: Moderator's summary for email discussion [93e-19-MBS-WI]

Document for: Discussion

# 1 Introduction

The purpose of the email thread for which this document serves as a summary is to address the contributions on Rel-17 MBS.

# 2 Initial Round Discussion

To kick off the initial discussion, the following sub-sections provide general questions for collecting views on the issues brought up in the contributions. The views expressed can then be used to potentially discuss specific proposals in the next phase.

## 2.1 Rel-17 NR MBS Scalability Issues

The following observations were made in [1].

**Observation 1:** With growing numbers of UEs, signaling and processing the candidate UE lists for paging may consume valuable time.

**Observation 2:** With growing numbers of UEs, establishment of associated PDU Session Resources will consume valuable time.

**Observation 3:** With growing numbers of UEs, per-UE RRCReconfiguration for MBS resources will consume valuable time in highly populated cells/gNBs.

**Observation 4:** It is expected that multicast traffic reception in RRC\_IDLE/INACTIVE will enable to further improve 5GS responsiveness for multicast NR MBS.

**Observation 5:** With growing numbers of UEs, obligatory establishment of associated PDU Session Resources - just to provide joining information to RAN - 5GS capacity will be wasted.

**Observation 6:** With growing numbers of UEs it can be expected that paging resources might be blocked for more than one (complete) DRX cycle.

**Observation 7:** The Rel-17 MBS WID mentions transmission areas within a single gNB-DU, which in turns limits the number of cells and of UEs to be considered. This is the likely reason why scalability did not seem to be a concern so far. However, if and when the single gNB-DU limitation is lifted, the scalability issue will be very evident.

**Observation 8:** It would be beneficial to re-visit current concepts to ensure that mechanisms that are only applicable for interworking with non-supporting NG-RAN nodes do not have to be executed in case of homogenous NR MBS deployment.

Based on these observations, the following was proposed.

**Proposal 2.1-1:** We therefore propose for RAN to discuss the observations made in chapter 2 acknowledging the scalability issues described. Depending on the outcome of the discussion, it might be appropriate to draft an LS to the appropriate WGs to make them aware of these findings.

The following questions invite views on this aspect.

**Q1: Please provide your views on the following in the table below**

1. **General views on the observations listed above from** [1]**.**
2. **Based on the observations, is an LS to the appropriate WGs necessary?**
3. **If an LS is necessary, which WGs should the LS be sent to?**

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| **Company** | **Views** |
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## 2.2 Intra-DU SFN for Rel-17 NR MBS

Stating that intra-DU SFN for broadcast cannot be purely left up to network implementation and some essential components have to be specified to enable support of intra-DU SFN for broadcast, [2] proposed the following.

**Proposal 2.2-1:** To facilitate WG discussions,

* Revising the WID to include RAN1 into the relevant objective:
	+ *Study the support for dynamic control of the Broadcast/Multicast transmission area within one gNB-DU and specify what is needed to enable it, if anything [RAN1, RAN2, RAN3]*
* Alternatively, confirm the support of intra-DU SFN in Rel-17 NR MBS and specify necessary components to enable its support.

**Q2: Please indicate your support or lack thereof for each of the following**

1. **Add RAN1 as a responsible working group for the objective relevant to intra-DU SFN as in the first bullet of proposal 2.2-1 above.**
2. **Agree in RAN#93e to confirm the support of intra-DU SFN in Rel-17 NR MBS and specify necessary components to enable its support as proposed in the second bullet of proposal 2.2-1 above.**

**Reasons, views in general and any alternate proposals in case you don’t support either of the above proposals may also be provided.**

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| **Company** | **Views** |
| LG1 | We do not support adding this proposal due to the following reasons:* In WID, it is stated that *no standardized support specifically for SFN is provided in this WI. Any SFN operation is transparent to the UE, and any related synchronization is left to network implementation. The existing QCL framework (based on SSB and CSI-RS) is reused.* Thus, this restriction and assumption should be removed to support standard impact from intra-DU SFN for broadcast.
* We wonder if the objective of dynamic control of the Broadcast/Multicast transmission area is really related to SFN because MBSFN is semi-statically configured in LTE MBMS. Dynamic control of the area seems related to dynamic cell on/off for non-SFN broadcast/multicast for RAN2/3.
* We are reluntant to add more work at the last moment of this WI phase.

Alternatively, we think that standard work necessary for intra-DU SFN (as well as inter-DU SFN, if supported) could be considered in Rel-18 WI. |

## 2.3 Common Frequency Resource (CFR) for Broadcast

The issue of common frequency resource (CFR) for broadcast has been discussed for many meetings in RAN1. To make further progress, the following is proposed in [2].

**Proposal 2.3-1 (from RAN1#106e):** Support the following proposal from RAN1 chair notes:

Proposal:

For a configured/defined CFR for GC-PDCCH/PDSCH carrying MCCH and MTCH for broadcast reception with UEs in RRC IDLE/INACTIVE state.

* + Support Case-C
	+ Working assumption: Support at least one of Case D and Case E.
		- Down-selection to be made at RAN1#106b-e
	+ Note: Case C, D and E are defined in previous agreements

The following is an alternate proposal from [3] on the same issue.

**Proposal 2.3-2**: For a configured/defined CFR for GC-PDCCH/PDSCH carrying MCCH and MTCH for broadcast reception with UEs in RRC IDLE/INACTIVE state, Rel-17 MBS supports all of the following cases with a common configuration framework to accommodate different broadcast services with different requirements.

* The CFR is larger than the initial DL BWP configured by SIB1.
* The CFR is the same as the initial DL BWP configured by SIB1
* The CFR is larger than CORESET#0 but smaller than the initial DL BWP configured by SIB1.

Note: The CFR fully contains CORESET#0.

**Q3: Please provide your answers to each of the following in the table below**

1. **Do you support the proposal 2.3-1 above?**
2. **Do you support the proposal 2.3-2 above?**

**Reasons, views in general and any alternate proposals in case you don’t support either of the above proposals may also be provided.**

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| **Company** | **Views** |
| LG1 | We generally support both proposals for progress. RAN1 already spent much time on this topic. If possible, we could change to one of the following alternative Proposal 2.3-1: *Alt 1:** + *~~Working assumption:~~ Support at least one of Case D and Case E.*
		- *Down-selection to be made at RAN1#106b-e*

*Alt 2:** + *~~Working assumption:~~ Support ~~at least one of~~ Case D and Case E.*
		- *~~Down-selection to be made at RAN1#106b-e~~*
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## 2.4 Lossless HO for Rel-17 MBS

Lossless HO support for Rel-17 MBS is discussed in [4] with the following observations.

**Observation 1 No comprehensive evaluation on PDCP SN sync’s impacts to RAN and SA WGs.**

**Observation 2 No consensus achieved on PDCP SN sync’s impacts in RAN2/RAN3 so far.**

**Observation 3 PDCP SN sync brings significant architectural impacts, e.g., violating existing QoS modeling, NG-U tunnel design.**

**Observation 4 There are still variations for PDCP SN sync even it is agreed.**

**Observation 5 SA2 does not pursue lossless mobility from the architectural perspective.**

**Observation 6 Only basic mobility support is pursued for Rel-17 WI of NR MBS.**

**Observation 7 Overall implementation impact should be limited, in order to facilitate implementation and deployment for Rel-17 WI of NR MBS.**

**Observation 8 Only seamless handover where packet loss is allowed but service reception is continued, is pursued for Mission Critical Services over 5G MBS.**

**Observation 9 In SA1 spec that defines 5G MBS requirement TS 22.261, lossless HO support is not found either.**

**Observation 10 Reliable Multicast (without packet loss) is still a problem unsolved and won’t be solved in the short term in IP world.**

**Observation 11 Requirement on lossless HO support for NR MBS is not clear, and results in unnecessary and no-so-productive discussion in WGs.**

Based on these observations the following is proposed in [4].

**Proposal 2.4-1:** Rel-17 NR MBS does not pursue lossless handover.

**Q4: Please indicate your support or lack thereof for pursuing lossless handover in Rel-17 NR MBS in the table below. Reasons and general views related to this topic may also be provided.**

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| **Company** | **Views** |
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# 3 Intermediate Round Discussion

## 3.1 Moderator summary

# 4 Final Round Discussion

## 4.1 Moderator summary

# 5 Conclusion

# 6 References

1. RP-212093 The State of Rel-17 NR MBS Ericsson, AT&T
2. RP-212267 Discussion on the progress of Rel-17 NR MBS Huawei (rapporteur)
3. RP-212414 Discussion on CFR configuration for Rel-17 MBS ZTE, Nokia, Nokia Shanghai Bell, Qualcomm, vivo, Convida Wireless
4. RP-212415 Views on lossless HO for Rel-17 MBS ZTE, Sanechips