**3GPP T****SG-RAN WG2 Meeting #119bis-e R2-2210879**

Online, 10 – 19 Oct 2022

**Title: [DRAFT] Reply LS on FS\_5MBS\_Ph2 progress**

**Response to: LS of R2-2209356/S2-2207470 on FS\_5MBS\_Ph2 progress from SA2**

**Release: Release 18**

**Work Item: NR\_MBS\_enh-Core**

Source: Huawei [will be RAN2]

**To: SA2, RAN3**

**Cc: RAN1**

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**Attachments:** **None**

# 1 Overall description

RAN2 thanks SA2 for their LS on FS\_5MBS\_Ph2 progress, the content of which is copied below:

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| --- |
| 1. SA2 understands that it is NG-RAN decision on how to deliver MBS data to the UEs and whether to transition UEs receiving MBS data in an MBS session to RRC Inactive state.

SA2 is discussing whether AFs can recommend not to enable the function in NG-RAN for inactive reception for MBS sessions which are particularly sensitive for packet loss. Further, SA2 is discussing solutions where some UEs might not be suitable to be sent to RRC Inactive state (e.g., priority users in a multicast group).SA2 is also discussing "assistance information" that can be provided by the core network (possibly based on input from the AF) to assist NG-RAN in those decisions.**Q1: SA2 would also like to understand:*** 1. **If there are significant differences in the quality and reliability of the reception of MBS data between UEs in RRC Connected state and UEs in RRC Inactive state**
	2. **If it is possible, as part of the same MBS session, to have some UEs receiving in RRC Connected state, while other UEs receiving in RRC Inactive state**
	3. **If the answer to b) is yes, will a UE incur MBS data loss while transitioning (under NG-RAN control) between RRC Connected state and RRC Inactive state in the middle of MBS data session? If yes, how long can the reception outage be?**
	4. **Whether the existing QoS parameters of MBS QoS Flow(s) are enough or some additional parameter is needed for NG-RAN to differentiate different MBS session and UE, which can be used by NG-RAN to decide how to deliver the MBS data.**

**Q2: SA2 would like to receive feedback on the value of such assistance information from RAN perspective?** SA2 assumes that backward compatibility with Rel-17 UEs will be ensured and that NG-RAN will need to know whether the UEs it serves have the Rel-18 MBS capability to receive multicast in RRC\_INACTIVE state. **Q3: SA2 would like to ask if the UE radio capability provided directly from UE to NG-RAN will contain the information whether the UE supports Rel-18 MBS capability to receive multicast data in RRC\_INACTIVE state?**1. SA2 assumes, when **MBS session is activated**, the UEs that have previously joined the MBS session and are in RRC Inactive state, may either be kept in RRC Inactive state, or be transitioned to RRC Connected state to receive the MBS session data, depending on NG-RAN decision. The core network will continue to inform RAN nodes about MBS session activation to enable NG-RAN to send appropriate signalling to the UEs in the multicast group.

**Q4: SA2 would like to clarify with RAN WGs whether the assumption that IDLE UE will need to transition to connected state to start receiving the MBS data and CN initiated group paging (as defined in Rel-17) is thus still required for such UEs?** **Q5: When MBS Session is activated and MBS data allowed to be received in RRC\_INACTIVE state, is it possible that the RRC\_INACTIVE UE receives MBS data without going back to RRC connected state? If possible, when the MBS session is being activated, how is the RRC\_INACTIVE UE notified?** **For group paging initiated for IDLE UEs, does RRC\_INACTIVE UE respond to such paging?**1. Regarding the **mobility within the RAN Notification Area (RNA)**, SA2 assumes the UE in RRC Inactive state should be able to continue receiving DL multicast MBS data within its RNA and the solution will be determined by RAN WGs as RRC\_INACTIVE mobility is under the remit of RAN WGs.

**Q6: SA2 would like to confirm with RAN WGs the above assumption.**1. Regarding the **MOCN RAN sharing for broadcast**, SA2 has several alternatives for this key issue#2. Some solutions assume MOCN RAN nodes can identify the same MBS service by the information provided by 5GC while some solutions can identify the MBS service is for MOCN RAN nodes based on configuration. SA2 considers backward compatibility with Rel-17 UEs as important.

SA2 is discussing whether it is feasible to use a single TMGI, with or without a special MNC within the TMGI to identify it as MOCN TMGI, or with an additional MOCN flag in signalling from CN towards RAN, or different TMGIs with additional identifier for multiple MBS broadcast sessions transferring the same content for different PLMNs. **Q7: SA2 would like to know if RAN considers any aspects of the proposed solutions for KI#2 as not feasible or desirable from RAN perspective?** |

Based on the discussion in RAN2, RAN2 would like to provide the following feedback for SA2’s questions:

**RAN2 Answer to Q1-a):**

* The reception quality and reliability of the reception of MBS data between UEs in RRC Connected state and UEs in RRC Inactive state may be different, as HARQ feedback and PTP transmission are not supported and seamless/lossless mobility is not required for multicast reception in RRC\_INACTIVE.

**RAN2 Answer to Q1-b):**

* Yes, it is supported that gNB transmits service of one multicast session to both UEs in RRC\_CONNECTED and RRC\_INACTIVE in the same cell. **It is assumed the gNB can choose which UEs receive in RRC\_CONNECTED and which in RRC INACTIVE.**

**RAN2 Answer to Q1-c):**

* There may or may not be interruptions and data loss during state transition, depending on the solution to provide the PTM configuration and also network implementation.

**RAN2 answer to Q1 d) and Q2:**

* For the MBS session handling: the existing MBS session QoS parameters (e.g. ARP, 5QI) can be used to differentiate different MBS sessions to decide whether the corresponding services can be provided to RRC\_INACTIVE UEs.
* For the case of differentiating different UEs: as the MBS session related QoS parameters are the same for different UEs within the same MBS session, the existing QoS parameters of MBS QoS Flow(s) cannot be used by NG-RAN to differentiate the handling for different UEs. FFS whether additional assistance information is needed if the handling for different UEs needs to be differentiated.

**RAN2 answer to Q3:**

* Yes, the UE radio capability indicating support of multicast reception in RRC\_INACTIVE state can be reported to RAN, which is subject to the discussion of UE radio capability.

**RAN2 answer to Q4:**

* Yes, the UEs in RRC\_IDLE need to be transitioned to RRC\_CONNECTED state to start receiving the MBS data and thus the CN initiated group paging is still needed to be performed.

**RAN2 answer to Q5:**

* It is possible that the RRC\_INACTIVE UE receives MBS data without going back to RRC\_CONNECTED state when the MBS session is being activated provided the UE has already joined the multicast session and the UE has valid MRB configuration. How Rel-18 UE in RRC\_INACTIVE state can be informed when the session is activated is under discussion in RAN2.
* For group paging initiated for UEs in RRC\_IDLE state, per Rel-17 specification, the RRC\_INACTIVE UEs will also respond **if they receive the corresponding paging message**. However, for Rel-18, if the MBS session can be received in RRC\_INACTIVE state, the RRC\_INACTIVE UE need not go back to RRC\_CONNECTED state if the UE has already joined the multicast session and the UE has valid configuration. It is FFS how to avoid these UEs going back to RRC\_CONNECTED state when the CN group paging is received.

**RAN2 answer to Q6:**

* RAN2 has made the following agreements: Multicast service continuity after cell reselection in RRC\_INACTIVE state (i.e. without resuming RRC connection) will be supported (if the configuration for the multicast session in the new cell is available for the UE). Upon cell reselection to neighbour cells during active multicast session, if the configuration of the session is not available for the new cell for UEs in RRC\_INACTIVE, then the UE is required to resume RRC connection to get the Multicast MRB configuration.

**RAN2 answer to Q7:**

* RAN2 would like to leave this question for RAN3 to respond.

# 2 Actions

**To SA2, RAN3 groups:**

**ACTION:** RAN2 kindly asks SA2 and RAN3 to take the above feedback into account.

# 3 Dates of next RAN2 meetings

TSG-RAN WG2#120 November 14th – 18th, 2022 Toulouse, France

TSG-RAN WG2#121 February 27th – March 3rd, 2023 Athens, GR