3GPP TSG-RAN WG3 #112-e R3-212703

Online, May 17th - May 28th, 2021

Agenda Item: 22.1

Source: CMCC (moderator)

Title: Summary of offline discussion on MBS\_LSsProgress

Document for: Discussion and Decision

# Introduction

**CB: # 98\_MBS\_LSsProgress**

**- (E///)**

**MBS Session state changes between ACTIVE and INACTIVE are realized on NG-C via NGAP means.**

**From an NG-RAN point of view, a per MBS Session association is setup and maintained between an MBS Session Resource instance in the NG-RAN node and corresponding one within the 5GC.**

**Aim toward an optimized support for a homogenous deployment where all gNBs support NR MBS. It shall be possible that functions, which are not essential to support such homogenous deployment do not have to be supported.**

**It shall be possible that in areas, where interworking with non-supporting NG-RAN nodes is not necessary, associated PDU Session resources are not allocated (i.e. such associated PDU Sessions are inactive from a NAS point of view) and still, NG-RAN nodes are kept informed about the joining status of such CM\_CONNECTED UEs.**

**Define only a minimum level of support for interworking with non-supporting NG-RAN nodes, given that optimum support is not in the interest of the vast majority of companies in 3GPP.**

**- (HW)**

**Introduce NGAP: Session activation/deactivation procedures for Multicast Session Management.**

**Introduce NGAP: Session Start/Stop/Update procedures for Broadcast Session Management.**

**Feed back to SA2 that RAN3 shares RAN2 view that for gNBs not supporting MBS, group notification using MBS session ID is not feasible, only legacy per UE paging is applicable.**

**Introduce a new NGAP message to support group paging from CN to RAN, i.e. GROUP PAGING.**

**Also prioritize RRC\_CONNECTED mode reception for multicast session in Rel-17.**

**Wait for SA3 progress on security aspects of MBS.**

**- (CMCC)**

**RAN3 aligns with RAN2 on multicast support for RRC\_INACTIVE and RRC\_IDLE**

**MBS non-supporting node does not be upgraded to be aware of any MBS related information**

**For UEs served by MBS non-supporting node, 5GC is required to fallback to regular paging for UEs that have not connected during MBS session activation in this release.**

**- Chair: seems good alignment; seems appropriate to start from principles (E///+CMCC contributions), to be captured in Chair’s notes if agreeable, and if feasible, agree on some st2/3-ish details (HW). Reply LS will then be a consequence of the above.**

(CMCC - moderator)

Summary of offline disc

This CB#98 will be organized in two phases:

**Phase 1: work on agreeable proposals to be captured in the Chairman notes.**

**Phase 2: Converge on agreeable LS**

The deadline for Phase 1 is Wednesday, May 19, end of day.

The deadline for Phase 2 depends on whether we need to capture in the LS RAN3 progress on MBS which will rely on progress of other CBs.

# For the Chairman’s Notes

TBD

# Discussion

## Key information from SA2 and RAN2

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| [R3-211426](C:\\Users\\pgodin\\Desktop\\philipDocuments\\a_ran3new2\\ran3112\\meeting\\CB # 98_MBS_LSsProgress\\Docs\\R3-211426.zip) | Reply LS on 5MBS progress and issues to address (RAN2) | LS in  Move to 22.1 |
| [R3-211453](file:///C:\Users\pgodin\Desktop\philipDocuments\a_ran3new2\ran3112\meeting\CB%20%23%2098_MBS_LSsProgress\Docs\R3-211453.zip) | Reply LS on 5MBS progress and issues to address (SA2) | LS in  Move to 22.1 |
| [R3-211515](file:///C:\Users\pgodin\Desktop\philipDocuments\a_ran3new2\ran3112\meeting\CB%20%23%2098_MBS_LSsProgress\Docs\R3-211515.zip) | Reply LS on 5MBS progress and issues to address (RAN2) | LS in  Move to 22.1 |

SA2 and RAN2’s replies address the following three key issues.

1. Session Start/Stop and Session Activation/Deactivation
2. Multicast session activation notification
3. Multicast support in different RRC states

The responses and further questions by SA2 are also summarized as below,

**SA2 Response:**

1. ***SA2 agreed to remove session start/stop procedures towards RAN and only have activation/inactivation procedures for multicast. The following states were defined:***
   * ***Active multicast session: Established multicast session in active state. Multicast data are transmitted to UEs that joined the multicast session. 5GC resources for the multicast session are reserved. Corresponding Radio resources are reserved depending on participating UE locations. UEs that joined the multicast session are in CM CONNECTED state. UEs are allowed to join the multicast session (subject to authorization check).***
   * ***Inactive multicast session: Established multicast session in inactive state. No multicast data are transmitted. UEs that joined the multicast session may be in CM CONNECTED or CM IDLE state. UEs are allowed to join the multicast session (subject to authorization check).***

***For broadcast, only session start/stop are applicable.***

1. ***SA2 would like to confirm that it is necessary for UE to receive the MBS Session activation notification (e.g., legacy paging) when it is served by a non-supporting NG-RAN node.***

***SA2 follow-up question: SA2 asks RAN2/RAN3 for feedback on whether UEs camping on non-supporting NG-RAN nodes can be notified using MBS session ID or the 5GC is required to fallback to regular paging for UEs that have not connected during MBS session activation.***

1. ***SA2 concludes that it is beneficial, e.g. for signalling efficiency, to support 5GC requesting NG-RAN nodes to notify session activation of an MBS session to UEs based on MBS session ID, at least to NG-RAN nodes supporting MBS.***

**RAN2 Response:**

1. ***RAN2 agreed to support group notification for multicast for MBS supporting nodes and that using MBS session ID for this purpose is feasible. RAN2 also agreed that the same group notification identity will be used for UEs in both RRC\_IDLE and RRC\_INACTIVE states.***
2. ***RAN2 concluded that for gNBs not supporting MBS, group notification using MBS session ID is not feasible as it would have an impact on such nodes. Notification using regular unicast paging is feasible in this scenario. Some companies are concerned about scalability issue when using legacy unicast paging if a large number of MBS users are served by non-supporting NG-RAN node (e.g. comparable to the number of users receiving an MBS service under MBS supporting node). However, majority of companies believes such scenario should be prevented by configuring/deploying the nodes to be MBS supporting node whenever there is sufficient demand. If a node covering large number of MBS UEs is configured/deployed as MBS non-supporting node, then radio resources capacity can be exceeded not only for paging channel, but also for data channels.***

Based on the contributions submitted, the reply LS from RAN3 may potentially comprise two aspects,

* Further questions asked by SA2
* RAN3 findings and progress on MBS

## Further questions asked by SA2 on multicast session activation notification

In RAN3#111e meeting, we reach an agreement that when an MBS session is (re-)activated, group paging may be used toward supporting nodes (to be checked against RAN2 progress).

RAN2 and SA2 confirmed the requirement in the reply LS and further ask our views on multicast activation notification for MBS non-supporting node.

For UE served in non-supporting MBS node, the reference papers [6][8] describes that non-supporting node could be considered as a legacy NG-RAN node, where legacy per UE paging is applicable and group paging using MBS session ID is not feasible.

In reference paper [4], a minimum level of support for interworking with non-supporting NG-RAN nodes would be proposed, given that optimum support is not in the interest of almost all companies in 3GPP.

**Proposal 1: For gNBs not supporting MBS, group paging using MBS session ID is not feasible, only legacy per UE paging is applicable.**

**Question 1: Do you agree with the proposal?**

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| --- | --- |
| Company | Comment |
| Lenovo, Motorola Mobility | Partially Agree.  We agree with the first sentence that using MBS session ID is not feasible for MBS non supporting gNBs.  However, for the second sentence, some companies in RAN2 are concerned about scalability issue when using legacy unicast paging. We are not sure whether only legacy per UE paging is applicable.  It would be better to wait for SA2 feedback first since RAN2 has already provided their response to SA2. |
| Nokia | OK |
| Huawei | ok |
| Samsung | Yes. |
| CATT | Yes |

In reference paper [6], it is further proposed a new group paging message based on MBS Session ID is introduced to support group paging from CN to RAN.

**Proposal 2: A new group paging message based on MBS Session ID is introduced to support group paging from CN to RAN**

**Question 2: Do you agree with the proposal?**

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| --- | --- |
| Company | Comment |
| Lenovo, Motorola Mobility | Too early to decide.  It would be better to wait for SA2 feedback first since RAN2 has already provided their response to SA2. |
| Nokia | Agree |
| Huawei | ok |
| Samsung | Group paging principle is agreeable.  But when look at which message should be used, it is actually related to MBS session activation procedure. It is not clear whether a MBS session level activation/deactivation message should be defined in Ng. These two issues are collocated and we prefer to have a consistent conclusion by considering both issues.  In general either a MBS session level activation message can be used to trigger a group paging, or group paging can be used to indicate the session is activated. Define two procedures in Ng is not efficient. |
| CATT | OK with the general principle  For the details on signaling design, it needs further discussions. Seems there is also discussion in CB#100 |

## RAN3 findings and progress on MBS

There is some preference, at least in [5] to inform SA2 and RAN2 our findings and progress on MBS. The potential proposals are,

* **MBS Session state changes between ACTIVE and INACTIVE are realised on NG-C via NGAP means.**
* **From an NG-RAN point of view, a per MBS Session association is setup and maintained between an MBS Session Resource instance in the NG-RAN node and corresponding Proposal 5: RAN3 shall aim at optimised support for a homogenous deployment where all gNBs support NR MBS. It shall be possible that functions, which are not essential to support such homogenous deployment do not have to be supported.**
* **It shall be possible that in areas, where interworking with non-supporting NG-RAN nodes is not necessary, associated PDU Session resources are not allocated (i.e. such associated PDU Sessions are inactive from a NAS point of view) and still, NG-RAN nodes are kept informed about the joining status of such CM\_CONNECTED UEs.**
* **RAN3 suggests to define only a minimum level of support for interworking with non-supporting NG-RAN nodes, given that optimum support is not in the interest of the vast majority of companies in 3GPP.**

Moderator observes that these proposals depend on discussions in dedicated CB, e.g., session management CB #100. To avoid the work duplication and have an extensive discussion in one place, Moderator proposes to have these discussions in the dedicated CBs. If RAN3 agrees to capture the findings of other CBs in the reply, it can be drafted accordingly.

**Proposal 3: RAN3 findings on specific topics which have individual agendas, e.g., session management are discussed in dedicated CBs.**

**Question 3: Please indicate if you have any comments.**

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| --- | --- |
| Company | Comment |
| Nokia | No need to send any LS back. The question was answered by RAN2. |
| Huawei | No strong view on whether to provide RAN3 progress to other groups for information or not.  For the content, better to wait the progress of other email discussions and online discussion. |
| Samsung | Some parts are RAN3 related and can first discuss in RAN3 in individual agenda. |
| CATT | Ok to send the LS back to inform SA2 of RAN3 agreement after there is conclusion on related topics. |

## Others

There are two BL CRs seems misplaces,

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| [R3-211472](file:///C:\Users\pgodin\Desktop\philipDocuments\a_ran3new2\ran3112\meeting\CB%20%23%2098_MBS_LSsProgress\Docs\R3-211472.zip) | Introduction of NR MBS (Lenovo, Motorola Mobility) | CR0071r3, TS 38.470 v16.4.0, Rel-17, Cat. B |
| [R3-211541](file:///C:\Users\pgodin\Desktop\philipDocuments\a_ran3new2\ran3112\meeting\CB%20%23%2098_MBS_LSsProgress\Docs\R3-211541.zip) | MBS BL CR for TS 38.410 (ZTE) | CR0031r, TS 38.410 v16.3.0, Rel-17, Cat. B |

They should be handled in CB #97

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| Company | Comment |
| Huawei | Handled in CB#97 |

# Conclusion, Recommendations [if needed]

If needed.

# References

1. R3-211426, Reply LS on 5MBS progress and issues to address (RAN2), LS in
2. R3-211453, Reply LS on 5MBS progress and issues to address (SA2), LS in
3. R3-211515, Reply LS on 5MBS progress and issues to address (RAN2), LS in
4. R3-212092, Discussion on the current status in SA2 and RAN2 (Ericsson)
5. R3-212093, [DRAFT] Reply LS on on 5MBS progress and issues to address (Ericsson) , LS out
6. R3-212422, Discussion about LSs on 5MBS progress and issues to address (Huawei)
7. R3-212423, [DRAFT] Reply LS on 5MBS progress and issues to address (Huawei), LS out
8. R3-212480, Discussion on SA2 reply LS on 5MBS progress and issues to address (CMCC)
9. R3-212481, [Draft]Reply LS to SA2 on 5MBS Progress and Issues to address (CMCC), LS out