3GPP TSG-RAN WG2 #117e Tdoc R2-22xxxxx

Electronic Meeting, 21st Feb – 3rd Mar 2022

Agenda Item: 8.1.1.2

Source: Ericsson

Title: AT117-e][040][MBS] Reply LS on max no of MBS sessions that can be associated to a PDU session (Ericsson)

Document for: Discussion

# 1 Introduction

This contribution summarizes the following email discussion:

* [AT117-e][040][MBS] Reply LS on max no of MBS sessions that can be associated to a PDU session (Ericsson)

Scope: Collection opinions and determine agreements in order to reply to Reply to LS in R2-2200141 (received at R2 116bis-e)

Intended outcome: Agreeable LS out (and a Report if applicable).

Deadline: W1 Thursday (for on-line CB W1 Friday)

Contact person(s) for each participating company:

|  |  |
| --- | --- |
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# 2 Discussion

In R2-2200141(S2-2109171) the following response from SA2 to CT1 was made:

**…**

**1. Overall Description:**

SA2 thanks CT1 for the LS on maximum number of MBS sessions that can be associated to a PDU session. SA2 discussed the LS and would like to provide the following feedback:

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| **currently CT1 assumes that the maximum number of MBS sessions that can be associated to a PDU session is limited to 4** |

**SA2 response:**

The UEs can be involved in multiple multicast MBS sessions in parallel, e.g.:

* In MCPTT (Mission Critical Push-To-Talk), the UEs can be involved in multiple group calls;
* In TV services, the UEs can be involved in multiple TV channels together with associated data channels.

Therefore maximum 4 MBS sessions that can be associated to a PDU session is not considered sufficient. To be more flexible and future proof, SA2 is thinking of a value between 8 to 32 to be the maximum number.

As the actual use cases are under the remit of SA4 and SA6, and there are limitations in relevant radio resources, e.g. number of DRBs per PDU Session, number of MRBs per cell as defined in RAN2, SA2 would also respectfully ask SA4, SA6 and RAN2 to provide feedback on the maximum number of MBS sessions that can be associated to a PDU session.

…

**SA2 ask RAN2 for feedback on** “ … the maximum number of MBS sessions that can be associated to a PDU session”

Rapporteur assumes that the question from SA2 is to understand the RAN limit, if any, on how many MBS sessions can be associated with one PDU session, i.e. one aspect is to understand how many MBS sessions one UE can join at a time.

In RAN2 there are currently assumptions that (e.g. CR introducing MBS in 38.300) a MBS session results in one or more multicast MRB configuration(s).

Additionally, the current assumption is that in Rel-17 MBS, the current defined max RB (i.e. 16 RB per UE) is reused. In addition to that, an optional UE capability of *maxMRB-Add* for additional MRBs support is adopted for multicast.

As a conclusion, the maximum number of *active* MBS session one UE can join at the same time is bound to the UE capability on max concurrent Radio Bearers (including impact from Split bearer types) that is used for a service.

For MBS one can assume that, as also pointed out by SA2, a unique MBS session for each group (or broadcast area) you are communicating with may be needed, and as a result, a low value of MBS sessions associated to each PDU Session would possibly restrict what is possible to achieve for the end user services. However, this suggests that UEs in different groups join different MBS Sessions.

From a signalling perspective, RAN2 should not have any particular view on a limit on the number of PDU Session associated MBS Sessions, whereas a limitation to what number of MRBs (including DRBs etc) to configure will need to be handled at RAN for any max number MBS to PDU Sessions. I.e. supporting a higher number of associated MBS Sessions, e.g., 32, would not be an issue itself, but the combined number of RBs the UE have to receive joining multiple active MBS Sessions needs consideration.

If companies agree to the above a brief clarification along those lines can be sent as reply to SA2. Should there be other considerations w.r.t. the association of MBS Sessions to PDU Sessions, company input is welcomed.

**Q: Company input on the maximum number of MBS sessions that can be associated to a PDU session:**

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| **Company** | **Comments** |
| Qualcomm | SA2 is asking what is limitation from Radio resource perspespective. From RAN2 perspective, we can indicate that default DRBs + MRBs = 16 and an optional UE capability of *maxMRB-Add* for additional MRBs support is adopted for multicast.  In R2-2202671, we proposed to have 4 MRBs as default and any additional MRBs is based on UE capability between 5 to 8. *maxMRB-Add* proposed value is 2 to 16. Once we agree UE capabilities for supporting MRBs, we can convey to SA2. Actual number of MBS sessions that can be associated with PDU session can be decided by SA2. |
| Nokia | Agree with the rapporteur’s suggestion of a brief clarification between number of sessions and MRBs; and also agree with Qualcomm on the need to wait for the UE capability to progress to indicate the number of MRBs. |
| CATT | Even though we agree with rapporteur that normally RAN2 should not have any particular requirement on the maximum number of MBS Sessions,but we should inform SA2 that the maximum number of MRB(i.e. 16) defined by RAN2 will eventually limit the maximum number of MBS sessionthat can be associated to a PDU session(i.e. can not exceed 16).  A MBS session may contain one or multiple MBS flows and one or multiple MBS flows of one MBS session can map to one MRB, and MBS flows from different MBS sessions can not mapped to a same MRB,So The maximum number of MBS session should not exceed the maximum number of MRB(i.e. 16). |
| vivo | We agree with the Rapporteur’s analysis. So we can reply SA2 that the current defined max RB (i.e. DRBs + MRBs = 16 RB per UE) and an optional UE capability of *maxMRB-Add,* e.g. 16,for additional MRBs support is adopted for multicast. |
| OPPO | We agree with rapporteur’s clarification. |
| Intel | Agree with rapporteur’s clarification regarding the relationship between the maximum number of MBS sessions and MRBs. Also agree with Qualcomm to wait for the UE capability discussion regarding the maximum number of MRBs. |
| Huawei, HiSilicon | Generally, we share the view of Rapporteur.  From RAN2 perspective, there is no need for the limit on number of MBS sessions that can be associated with a PDU session, especially considering that there may be only one ongoing PDU session for the UE. Actually, there seems no problem if all MBS sessions of a UE are associated with one PDU session.  For the maximum number of MRBs, it is still not decided how many additional MRBs that can be supported by the UE optionally. So the actual maximum number of MRBs is up to capability discussion before being indicated to SA2. We think supporting a relatively larger additional range (e.g. 32 or 64) would be beneficial as the actual supported number is anyway indicated by UE. |
| Samsung | Agree with the rapporteur’s point that RAN2 should not have any particular view on a limit on the number of PDU Session associated MBS Sessions, whereas a limitation to what number of MRBs (including DRBs etc) to configure will need to be handled at RAN for any max number MBS to PDU Sessions.  The maximum number of active MBS sessions will be determined based on the UE capability for supported concurrent MRBs along with DRBs and split bearer configurations. We can progress on the UE capability first and indicate support of maximum number of MRBs to SA2. |
| Lenovo | We agree with the Rapporteur’s analysis. We also share companies’ view that the current max RB (i.e. DRBs + MRBs = 16 RB per UE) and an optional UE capability of *maxMRB-Add* for additional MRBs support is adopted for multicast. |
| MediaTek | Agree with the rapporteur’s clarification. RAN2 should inform SA2 the maximum number of supporting MRB (total RBs) when there is an agreement in the UE capability discussion, and the number of MBS sessions should not exceed the number of supporting RBs. |
| LGE | We agree with rapporteur’s anlaysis. The mapping rule between MRB and MBS session can be informed. For the number of MRBs, the UE capability discussion can be considered. |
| CMCC | Agree with rapporteur’s analysis that RAN2 should not have any particular view on a limit on the number of PDU Session associated MBS Sessions, and we should indicate SA2 the current defined max RB and an optional UE capability of maxMRB-Add for additional MRBs support is adopted for multicast. |
| Spreadtrum | We agree with rapporteur’s anlaysis. We should inform SA2 the maxmum number of MRBs in UE on RAN2 agreements. The maximum number of MBS sessions should not exceed the maxmum number of MRBs. |
| ZTE | We generally agree with rpptr's analysis above.  just to clarify:  - The question is about the number of MBS session associatiated to ONE PDU session, which might be 32.  - however RAN WGs are currently defining the UE capability per UE rather than per PDU session.  - per UE capability limitation can be an upper bound of such association  - another limitation might come from the max G-RNTI one UE can be configured. currently it is 16 and FFS if RAN1 has new inputs. (not sure if this is shared between BC and MC for one UE) |
| Futurewei | We agree with rapporteur’s anlaysis in general. The outcome from the UE capability discussion on max number of RBs should be considered here. |
| Xiaomi | We agree with the analysis provided by the Rapporteur. We can inform SA3 that the maximum number of MRBs, and the combination of MRBs and DRBs. |

**Summary: All companies agree on the main points made by Rapporteur in terms that:**

* **RAN2 does not have any particular view on the number of MBS Sessions associated to a PDU Session.**
* **However, this association may need to consider the limitation of total number Radio Bearers a UE can support which includes Multicast MRBs.**

**Q: Any additional comments can be made here (e.g RAN2 agreements needed, clarifications, modelling, etc):**

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| **Company** | **Comments** |
| Qualcomm | We need to first agree RAN2 UE capabilities for supporting MRBs as we commented in Q1. |
| Nokia | See above. |
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**Rapporteur: As capabilities are under discussion, the outcome from that can be conveyed to other groups as there are agreements and specification text to those.**

# Conclusion

**A Draft Reply LS conveying the view from this discussion as summarized under Q1 to be approved.**