**3GPP TSG RAN WG1#118bis**  **R1-2410706**

**Hefei, China, October 14th – 18th, 2024**

Agenda Item: 8.1

Source: Moderator (CATT)

Title: Summary of discussion of reply LS on CBR Range

Document for: Discussion and Decision

# Introduction

In [1], RAN2 identified that the maximum number of CBR ranges for dedicated SL PRS resource pool, the maximum number of CBR levels for dedicated SL PRS resource pool and the maximum number of SL PRS transmission Configuration index in sl-PRS-TxConfigIndexList-r18 in RRC spec are not fully aligned with the RAN1’s parameter list. The details are:

* *The maximum number of CBR ranges for SL positioning is 7 in RRC IE sl-CBR-RangeDedicatedSL-PRS-RP-List-r18 instead of 8 designed by RAN1,*
* *The maximum number of CBR levels is 15 in RRC IE SL-CBR-LevelsDedicatedSL-PRS-RP-r18 instead of 16 designed by RAN1,*
* *The maximum number of SL PRS transmission Configuration index in sl-PRS-TxConfigIndexList-r18 is 15 in RRC spec instead of 16.*

Considering the ASN.1 has already been frozen and extending the value of these parameters will cause complicated signalling work and may cause messiness in asn.1, RAN2 agreed not to update the asn.1 for adding the missing one value for the maximum number of configurations for the parameters above according to RAN1’s parameter list.

RAN2 asks RAN1 if it is acceptable that CBR range, CBR level and SL-PRS-TxConfigIndexList are not extended as RAN2 agreed, and provide feedbacks if needed.

This document provides a summary of the discussion of above in response to RAN2’s LS ([2-12]).

# Discussion

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| Huawei, HiSilicon [2] | ***Proposal 1: Reply to RAN2 that*** ***RAN1 prefers to stick with RAN1 parameter list and respectfully requests RAN2 to initiate a thorough RIL review with respect to the ASN.1 of CBR of SL-PRS dedicated resource pool.*** |
| CATT, CICTCI [3,4] | **Proposal 1: Regarding the question related to CBR ranges for dedicated SL PRS resource pool in the RAN2 LS R1-2409345(R2-2409258), suggest providing the following response:**   * **From RAN1 perspective, it is acceptable that CBR range, CBR level and *SL-PRS-TxConfigIndexList* are not extended as RAN2 agreed.** |
| OPPO[5,6] | Proposed reply:   * ***The maximum number of CBR ranges for SL positioning should be extended to 8 as designed by RAN1.*** * ***It is acceptable that CBR level and SL-PRS-TxConfigIndexList are not extended as RAN2 agreed.*** |
| Intel[7] | To the question from RAN2, while it is preferable to have specified according to the RAN1 design as it aligns with the design for SL communications, the current value ranges can be acceptable and it can be ultimately up to RAN2 to decide whether to update the current RRC specifications or not. |
| ZTE, Sanechips [8, 9] | **Proposal 1: Recommend RAN2 to add a NW restriction that index range used in SL-PriorityTxConfigIndexDedicatedSL-PRS-RP should not be larger than that defined in SL-CBR-CommonTxDedicatedSL-PRS-RP-List, to avoid the complicated BC ASN.1 change.**  **Proposal 2: SL-CBR-CommonTxDedicatedSL-PRS-RP-List for SL positioning should be configured in SL-UE-SelectedConfig, instead of both SL-PRS-ResourcePool and SL-UE-SelectedConfig.** |
| Qualcomm[10] | * RAN1 prefers the maximum numbers for the parameters described above to be the same with the corresponding maximum numbers in SL communications for ensuring consistency across SL communications and SL positioning. |
| Ericsson [11,12] | * RAN1 should respond that RAN2 that CBR range, CBR level and SL-PRS-TxConfigIndexList values do not need to be extended as RAN2 agreed. |

FL Comments:

Based on proposals from interested companies, a number of companies prefer that RAN2 maintains the maximum numbers for Channel Busy Ratio (CBR) parameters as provided to RAN2 in RAN1’s parameter list to ensure consistency across SL communications and SL positioning (e.g., [2][7][10]). A number of other companies, however, find it acceptable that the CBR range, CBR level, and *SL-PRS-TxConfigIndexList* are not extended, as agreed by RAN2 (e.g., [3][17][11]). One company [5] believe the maximum number of CBR ranges for SL positioning should be 8, as initially designed by RAN1[5]. Additionally, one company [8] pointed out some issues in RAN2 specifications, such as the inconsistency of the index range in the current RAN2 specifications, and recommended solutions to address them.

From RAN1’s perspective, it would be preferable for RAN2 to follow the parameter ranges provided by RAN1. However, considering that the only difference in ranges between RAN1 and ASN.1 in RAN2 is only 1 (e.g., 7 instead of 8 CBRs, 15 levels instead of 16), and that RAN1’s design anticipates worst-case scenarios, it seems most of the companies have strong objections on RAN2’s agreement. The congestion control for SL should still function properly with the current limitations in RAN2’s ASN.1. The impact on congestion control performance is anticipated to be minimal and may only be noticeable in extreme situations. Therefore, given the potential challenges of changing ASN.1 for Rel-18, it seems reasonable to retain the values in the current RAN2 specifications without further extensions for Rel-18. RAN1 could recommend that RAN2 address this issue for Rel-19.

Regarding the additional issues of ASN.1, such as parameter index inconsistencies [8], one approach is to include RAN1’s recommendation in the reply LS to RAN2. Another approach is for the interested companies to propose a resolution directly in RAN2, as RAN2 should be responsible for parameter consistency in RAN’s specification.

### (Round1) Proposal 1

**Adopt one of the following options in response to RAN2’s LS on CBR:**

***Option 1:***

* ***RAN1 prefers that the maximum values for the following parameters in ASN.1 are specified as proposed by RAN1, i.e.,*** 
  + ***The maximum number of CBR ranges for SL positioning is set to 8 in RRC IE sl-CBR-RangeDedicatedSL-PRS-RP-List-r18,***
  + ***The maximum number of CBR levels is set to 16 in RRC IE SL-CBR-LevelsDedicatedSL-PRS-RP,***
  + ***The maximum number of SL PRS transmission Configuration index in sl-PRS-TxConfigIndexList-r18 is set to 16.***
* ***However, although it is not preferred, it is acceptable that the CBR range, CBR level and SL-PRS-TxConfigIndexList parameters are not extended, as RAN2 agreed.***

***Option 2:***

* ***It is acceptable that CBR range, CBR level and SL-PRS-TxConfigIndexList are not extended, as RAN2 agreed.***

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| **Company** | **comments** |
| ZTE | Option 1  Another thing to mention is regarding our second proposal. From our side, SL-CBR-CommonTxDedicatedSL-PRS-RP-List for SL positioning should be configured in SL-UE-SelectedConfig and applicable for all mode 2 resource pools. But per RAN1’s RRC parameter list, SL-CBR-CommonTxDedicatedSL-PRS-RP-List is configured under SL-PRS-ResourcePool. That’s why currently we configure SL-CBR-CommonTxDedicatedSL-PRS-RP-List in both SL-PRS-ResourcePool and SL-UE-SelectedConfig.  **Proposal 2: SL-CBR-CommonTxDedicatedSL-PRS-RP-List for SL positioning should be configured in SL-UE-SelectedConfig, instead of both SL-PRS-ResourcePool and SL-UE-SelectedConfig.** |
| Qualcomm | We can accept Option 1 |
| Huawei, HiSilicon | We have some concerns on setting this bad precedence. RAN1 is bearing the consequence of the oversight of RAN2. We also noticed some other problems in the current ASN.1.  In general, in order to progress, we suggest the following modification.   * ***RAN1 prefers that the maximum values for the following parameters in ASN.1 are specified as proposed by RAN1, i.e.,***    + ***The maximum number of CBR ranges for SL positioning is set to 8 in RRC IE sl-CBR-RangeDedicatedSL-PRS-RP-List-r18,***   + ***The maximum number of CBR levels is set to 16 in RRC IE SL-CBR-LevelsDedicatedSL-PRS-RP,***   + ***The maximum number of SL PRS transmission Configuration index in sl-PRS-TxConfigIndexList-r18 is set to 16.*** * ***However, although it is not preferred, it is acceptable that the CBR range, CBR level and SL-PRS-TxConfigIndexList parameters are not extended, as RAN2 agreed.*** * ***RAN1 respectfully request RAN2 to identify whether there exists other ASN.1 issues in CBR, e.g., SL-CBR-LevelsConfig-Dedicated-SL-PRS-RP is used but not defined, The maxNrofSL-PRS-TxConfig-r18 should be 63 instead of 64*** |
| CATT | Prefer Option 2. But, either option is acceptable to us. |
| Intel | Support Option 1.  Also, the additional point from Huawei seems valid. For the value of ***maxNrofSL-PRS-TxConfig-r18***, it would be more appropriate to keep the value of as 64 (aligned with RAN1’s parameter list) and instead use “INTEGER (0.. maxNrofSL-PRS-TxConfig-1-r18)” with “maxNrofSL-PRS-TxConfig-1-r18” as a new parameter with value of 63. However, this can be left up to RAN2. |

### (Round1) Proposal 2

***Include the following additional information in the reply LS to RAN2:***

* ***RAN1 respectfully requests RAN2 to ensure consistency among the maximum values related to SL Positioning CBR parameters. For example, the index range used in SL-PriorityTxConfigIndexDedicatedSL-PRS-RP should not exceed the range defined in SL-CBR-CommonTxDedicatedSL-PRS-RP-List.***

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| **Company** | **comments** |
| ZTE | Agree |
| Qualcomm | Unclear whether it is needed, given RAN1 was not asked about this. |
| Huawei, HiSilicon | Not sure whether it is needed. |
| CATT | No strong view. It may help, but we assume RAN2 will check the consistency without the request from RAN1. |

# Proposal for online session

### TBD

# References

1. R1-2409345(R2-2409258) LS to RAN1 on CBR range RAN2, CATT
2. R1-2409400 Discussion on LS to RAN1 on CBR range Huawei, HiSilicon
3. R1-2409916 Discussion on CBR range CATT, CICTCI
4. R1-2409917 Draft reply LS on CBR range CATT, CICTCI
5. R1-2410069 Discussion on LS about CBR range OPPO
6. R1-2410070 Draft reply LS to RAN2 on CBR range OPPO
7. R1-2410145 Draft Reply LS on on CBR range for SL Positioning Intel Corporation
8. R1-2410451 Discussion on CBR range for SL positioning ZTE Corporation, Sanechips
9. R1-2410452 Draft reply LS on CBR range for SL positioning ZTE Corporation, Sanechips
10. R1-2410462 Draft reply for the LS to RAN1 on CBR range Qualcomm Incorporated
11. R1-2410614 Discussion on LS to RAN1 on CBR range Ericsson
12. R1-2410616 Draft reply LS on LS to RAN1 on CBR range Ericsson