3GPP TSG-RAN WG2 #118 R2-220xxxx

eMeeting, 09th May – 20th May, 2022

Agenda Item: 6.22.3.3

Source: Apple

**Title: Summary of [AT118-e][061][MGE] Network Configured Small Gaps (Apple)**

Document for: Discussion and decision

# 1 Introduction

This is the summary of the following email discussion. R2-2205692 will be handled in offline #059 as a follow-up discussion thus is removed from here.

* [AT118-e][061][MGE] Network Configured Small Gaps (Apple)

Scope: Progress remaining issues and attempt to converge. Treat R2-2204545, R2-2205727, ~~R2-2205692~~, R2-2206070, R2-2206071.

Intended outcome: Report with agreements, TP if needed.

Deadline: CB W2 TUE

# 2 Discussion

## 2.1 On deriveSSB-IndexFromCellInter [R2-2204545][R2-2205727]

The relationship between deriveSSB-IndexFromCellInter and legacy deriveSSB-IndexFromCell was touched in last RAN2 meeting without achieving a conclusion. Two options were mentioned in last RAN2 meeting. It was also raised up in RIL Z142.

* Option 1: When *deriveSSB-IndexFromCellInter* is included, the network must set *legacy deriveSSB-IndexFromCell* IE to true;
* Option 2: UE ignores legacy *deriveSSB-IndexFromCell* IE once *deriveSSB-IndexFromInter* is received.

There are two different kinds of change in the reference contributions.

**Option 1: Change in R2-2205727**

**Proposal 1: For an MO, when *deriveSSB-IndexFromCellInter* is included, the network should set legacy *deriveSSB-IndexFromCell* IE to true.**

**Proposal 2: RAN2 to update the field description of *deriveSSB-IndexFromCellInter*.**

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| If this field is present, UE assumes SFN and frame boundary alignment between the reference serving cell indicated by *ServCellIndex* and all neighbour cells in this *MeasObjectNR* as specified in TS 38.133 [14]. This field also indicates that the UE can utilize the timing of the reference serving cell indicated by *ServCellIndex* to derive the index of SS block transmitted by all neighbour cells with same frequency as this *MeasObjectNR*. The neighbour cell(s) is on a frequency different than serving cell frequency from the reference serving cell. When this field is included, the network should set *deriveSSB-IndexFromCell* to true. |

**Option 2: Change in R2-2204545**

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| ***deriveSSB-IndexFromCellInter***  If this field is present, UE assumes SFN and frame boundary alignment between the reference serving cell indicated by *ServCellIndex* and all neighbour cells in this *MeasObjectNR* as specified in TS 38.133 [14]. This field indicates whether the UE can utilize the timing of the reference serving cell indicated by *ServCellIndex* to derive the index of SS block transmitted by all neighbour cells with same frequency as this *MeasObjectNR*. In addition, the field also indicates whether the UE may use the timing of any detected cell on that target frequency to derive the SSB index of all neighbour cells on that frequency. When this field is configured, the UE ignores the *deriveSSB-IndexFromCell.* |

**Question 1: Which option is preferred by companies?**

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| **Company** | **Option preferred** | **Comments** |
| MediaTek | Option 1 with comment | We think adding the last sentence “ When this field is included, the network should set *deriveSSB-IndexFromCell* to true.” is enough.  Not sure why we need “ The neighbour cell(s) is on a frequency different than serving cell frequency from the reference serving cell.” |
| Nokia | Option 1 | Proponent.  For the comment from MTK, the intention of the sentence is to say the new IE is only applied to inter-freq MO. However, in current field description, it seems there is no description to indicate that. |
| QCOM | Option-1 | Both options are fine, prefer option-1, to avoid any ambiguity that might rise when the 2 parameters are configured with different values.  For what has been suggested by MediaTek, I have the same view a Nokia, it’s good the full description of the field. |
| Huawei, HiSilicon |  | We don’t have a strong preference between the two options, one is from NW perspective and the other is from UE perspective.  If Option 1 really wants to emphasize it is for inter-frequency, maybe it can be reworded as follows:  If this field is present, UE assumes SFN and frame boundary alignment between the reference serving cell indicated by *ServCellIndex* and all neighbour cells in this *MeasObjectNR* as specified in TS 38.133 [14]. This field also indicates that the UE can utilize the timing of the reference serving cell indicated by *ServCellIndex* to derive the index of SS block transmitted by all inter-frequency neighbour cells on the frequency indicated by the *MeasObjectNR*. When this field is included, the network should set *deriveSSB-IndexFromCell* to true. |
| Intel | Option 1 | Option 1 is slightly preferred as it is more clear. We are ok with HW wording. |
| Apple | Option 1 | Compared with last RAN2 meeting, the situation becomes clearer with RAN4 new LS in R4-2206890 indicating that the SFN and frame boundary can be assumed among all cells on the frequency.  For the text to explicitly say it is “inter-freq” from the serving cell, we think it is better to have. We are fine with Huawei wording. |
| ZTE | Option 2 | Proponent  Usually, we don’t use two IEs to indicate the same thing (e.g. all neighbour cells are synchronized), that is why we think Option 1 is simpler and cleaner. It can also reduce the risk of mistakes in network implementation.  However, our main goal is to solve this problem, so we can also accept Option 1 if majority of companies support. |
| LGE | Option1 | We are ok with HW wording. |
| Xiaomi | Option 1 | OK with HW wording. |
| LGE | Option1 | We are ok with HW wording. |
| Samsung | Option 1 | OK with HW wording |
| Ericsson | Option 1 | Agree with MediaTek + HW rewording. |

## Summary: 10 (out of 11) compaies prefer Option 1. 1 (out of 11) company prefer Option 2 but can accept Option 1. For the text to mention it is “inter-freq” from the serving cell, please the CR proponent take Huawei’s wording into account.

Proposal 1: The change in R2-2205727 can be agreed. Companies’ comments on wording should be taken into account.

## 2.2 Corrections on MGTA and MGL [R2-2206070]

The CR in R2-2206070 have several changes to MGTA/MGL and are addressing RIL(s) [H804][H805][H806].

Reason for changes:

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| 1. [H804] As metioned in LS from RAN4 (R4-2206890), the mgta = 0.25ms should not be used for NCSG. 2. [H805] There are some typos in the *MeasGapConfig* IE, i.e. “nscg” should be “ncsg”. 3. [H806] The *mgta-r17* and *mgl-r17* fields are adding new values for an existing filed, so “-v17xy” should be used instead of “-r17”.   The following was agreed in the RAN2 ASN.1 AdHoc meeting:  H020 Suffix v1700 or r17  *ConfiguredGrantConfig: noOfHARQ-ProcessesExt-r17*  *[Description]: This extends an existing field, so the suffix should be v1700*  *[Proposed Change]: Change the suffix to v1700.*  DISCUSSION   * Ericsson think we havent been completely consistent, have a weak preference for removing the “Ext” and using the -v1700. Intel support to remove the Ext. * Remove the “Ext”, and use -v1700 (NCE with only new values) and apply this consistently.   4) The values in *mgta-r17* IE and *mgl-r17* IE can be only used for NCSG, which should be embodied in the spec. |

Summary of changes:

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| 1. Add clarfication that mgta=0.25ms cannot be configured to NCSG in field descriptions of *mgta* IE. 2. Change “nscg” to “ncsg” in the *MeasGapConfig* IE. 3. Change *mgta-r17* and *mgl-r17* to *mgta-v1700* and *mgl-v1700* respectively. 4. Add conditions to *mgta-r17* IE and *mgl-r17* IE. |

**Question 2: Do companies agree the changes in the CR?**

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| **Company** | **Yes / No on changes 1) – 4)** | **Comments** |
| MediaTek | 1) - Yes  2) – Already agreed  3)– Already rejected  4) – Yes with comment | For 2), it is already agreed in P1 of R2-2205220.  For 3), it is already rejected by P2 of R2-2205220. Also, it is irreverent if we adopt E033/E034 now.  For 4), Instead of conditional code, we suggest to describe this in field description based on the new IE structure proposed in R2-2205229. |
| Nokia | Yes for 4) | For 1), 2), 3), agree with MTK.  Change 4) is OK. |
| Qualcomm | Same as MediaTek |  |
| Huawei, HiSilicon | Yes (Proponent) | For 3), we accept the rapporteur’s decision to reject (because the two fields can also be considered as critical changes). Since the rapporteur conclusion came a bit late and the CR was submitted already, we didn't manage to remove [H806] from the CR… |
| Intel | 1. Yes 2. Yes 3. No 4. Yes | As for 4. Field description should be enough. |
| Apple | Same as MediaTek | For 4), we also think explanation in field description is sufficient. |
| ZTE | No for 4) | For 1), 2), 3), agree with MTK.  For 4), we don’t think condition is needed and we prefer the suggestion from MTK, to capture it in the field description.  The new values may be applicable to other gap type or gap pattern in the future, using condition is not future proof. |
| LGE | 1. Yes 2. Yes 3. No | For 4, we also think the field description is sufficient. |
| Xiaomi | Yes: 1) and 2)  No: 3) | For 4), agree with intel. We also think field description is enough. |
| CATT | Same as MediaTek | For 4), adding in the field description is simple and clear. |
| Samsung | 1,2 and 4 | For 4, fine to add field description |
| Ericsson | Share views with MediaTek |  |

## Summary: All companies think 1 is agreeable. 2 and 3 are already addressed in R2-2205220. For change 4, 9 (out of 11) companies prefer capturing it in field description, instead of using conditional code.

Proposal 2: Agree the two changes:

1) Add clarfication that mgta=0.25ms cannot be configured to NCSG in field descriptions of mgta IE.

2) Capture in field descriptions of *mgta-r17* and *mgl-r17* that they are only used for NCSG.

## 2.3 Correction on ncsgind [R2-2206071]

The CR in R2-2206071 is to capture the statement in RAN4 LS [R4-2206890] that “NCSG for CSI-RS based inter-frequency measurement with gap is not supported in R17”.

The change is copied below for reference:

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| ***nscgInd***  Indicates that the measurement gap is a NCSG as specified in 38.133 [14]. This field is not present if the measurement gap is used for CSI-RS based inter-frequency measurements. |

**Question 3: Do companies agree with the change above?**

It is also fine to add the comments into the CR.

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| **Company** | **Yes / No** | **Comments** |
| MediaTek | See comment | We understand the intention but does not really think this change is needed. Isn’t already from capability part that the NCSG is used for SSB measurement only ? |
| Nokia | Yes | Fine to clarify it in field description. |
| Qualcomm | Yes | We prefer to have this clarification as part of the field description. |
| Huawei, HiSilicon | Yes (Proponent) | In 38.306, there is no restriction that NCSG only applies to SSB-based measurements.  ***ncsg-MeasGap-r17***  Indicates whether the UE supports the NCSG measurement gap as specified in TS 38.133 [5].  Maybe MTK’s comment refers to the *NeedForNCSG-InfoNR* in 38.331 which mentions “whether measurement gap or NCSG is required for the UE to perform SSB based measurements …”  However, in our understanding, the above sentence does not equal to “NCSG only applies to SSB based measurements”. We have a similar description in the R16 *NeedForGapsInfoNR* IE, but the R16 gaps can also be configured for CSI-RS (even though the UE does not request the gap like it does for SSB-based measurements). |
| Intel | See comment | We don’t think it is needed. If NCSG for CSI-RS based inter-frequency measurement with gap is not supported, there should be no configuration. If NW configures it, it will be wrong configuration. |
| Apple |  | Probably we can add the restriction that NCSG gap is only used for SSB measurement in NR into *ncsg-MeasGap-r17*? |
| ZTE | No, see comment | We would like to clarify something first:  1. Joint configuration of NCSG and concurrent gaps is not supported in R17, but RAN4 confirms NCSG can be configured together with legacy gap (e.g. one for FR1gap, the other for FR2 gap), so when NCSG is configured, the gap ID will not be indicated in MO, then how to determine “the gap is used for CSI-RS based intra-frequency measurements”?  2. Usually, if the gap configuration cannot satisfy the gap requirements for measuring a frequency, the UE will stop performing measurement on that frequency, but it is not a wrong configuration. Here, NCSG is used for SSB measurement only, but if the network configures both SSB and CSI-RS measurements, and NCSG, we understand the UE only measures SSBs by using NSCG, the CSI-RS measurements will not be performed, but it is not a wrong configuration.  If 1, 2 can be confirmed, then the added sentence is incorrect, we can rely on UE capability as mentioned by MTK.  [Apple]: We checked with our RAN4 colleague and tend to agree that we do not need to restrict the NW configuration on NCSG gap when inter-freq CSI-RS measurement is configured. Absent requirement is not equivalent to “configuration is not allowed”. |
| LGE | Yes | We are OK to clarify it. |
| Xiaomi | Yes |  |
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| CATT | Yes | Ok to clarify it according to RAN4 LS. |
| Samsung | No | NCSG can be used for SSB measurements and E-UTRA measurements. It can’t be used for CSI-RS, PRS, 2G/3G etc. We prefer not to specify CSI-RS case alone in RAN2 specs. Better to keep any such details in RAN4 specs alone. |
| Ericsson | See comment | No strong view and open to discuss the alternative solution, i.e., modify field description of UE capability. |

Summary: 6 (out of 11) companies agree with this change while 5 (out of 11) companies does not agree. One concern from ZTE is that the requirement restriction from RAN4 on “NCSG gap is not used for inter-freq CSI-RS measurement” does not mean network cannot configure UE both.

Alternative solution is to capture that NCSG is for SSB measurement in field description of UE capability *ncsg-MeasGap-r17*, as mentioned by two companies.

Proposal 3: Suggest to have more discussions to see if the alternative solution is agreeable: Capture that NCSG is for SSB measurement in field description of UE capability *ncsg-MeasGap-r17*.

# 3 Conclusions

**[TBA]**

# 4 References

[1] [R2-2204545](file:///C:\Users\mtk65284\Documents\3GPP\tsg_ran\WG2_RL2\TSGR2_118-e\Docs\R2-2204545.zip) [Z142] Correction on deriveSSB-IndexFromCellInter field ZTE Corporation, Sanechips draftCR Rel-17 38.331 17.0.0 F NR\_MG\_enh-Core

[2] [R2-2205727](file:///C:\Users\mtk65284\Documents\3GPP\tsg_ran\WG2_RL2\TSGR2_118-e\Docs\R2-2205727.zip) [Z142]On relationship between deriveSSB-IndexFromCellInter and deriveSSB-IndexFromCell Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_MG\_enh-Core

[3] [R2-2206070](file:///C:\Users\mtk65284\Documents\3GPP\tsg_ran\WG2_RL2\TSGR2_118-e\Docs\R2-2206070.zip) [H804][H805][H806] Corrections on mgta and mgl Huawei, HiSilicon CR Rel-17 38.331 17.0.0 3156 - F NR\_MG\_enh-Core

[4] [R2-2206071](file:///C:\Users\mtk65284\Documents\3GPP\tsg_ran\WG2_RL2\TSGR2_118-e\Docs\R2-2206071.zip) [H807] Clarification on ncsgInd Huawei, HiSilicon CR Rel-17 38.331 17.0.0 3157 - F NR\_MG\_enh-Core