3GPP TSG-RAN WG2 #118 R2-2205220

eMeeting, 09th May – 20th May, 2022

Agenda Item: 6.22.1.1

Source: MediaTek Inc.

**Title: Discussion on MGE RIL issues**

Document for: Discussion and decision

# 1 Introduction

The paper discusses how to handle the MGE related RIL issues (based on v125).

# 2 Discussion

Please check Rapp’s comment below.

**[RIL]**: H645 **[Delegate]**: (Huawei) Zheng Lili **[WI]**: **MGenh [Class]**: 1 **[Status]**: ToDo **[TDoc]**: None **[Proposed Conclusion]**:

**[Description]**: The format should be re-designed to increase readability

**[Proposed Change]**:

6> if *requestedTargetBandFilterNCSG-NR* is configured,

7> for each supported NR band included in *requestedTargetBandFilterNCSG-NR*, include an entry in *interFreq-needForNCSG* and set the NCSG requirement information for that band;

6> else

7> include an entry for each supported NR band in *interFreq-needForNCSG* and set the corresponding NCSG requirement information;

**[Comments]**: [MediaTek (Felix Tsai)]: As MGE RRC WI Rapp, mark this RIL as propAgree.

**[RIL]**: H646 **[Delegate]**: (Huawei) Zheng Lili **[WI]**: **MGenh [Class]**: 1 **[Status]**: ToDo **[TDoc]**: None **[Proposed Conclusion]**:

**[Description]**: The format should be re-designed to increase readability

**[Proposed Change]**:

6> if *requestedTargetBandFilterNCSG-EUTRA* is configured,

7> for each supported NR band included in *requestedTargetBandFilterNCSG-EUTRA*, include an entry in *interFreq-needForNCSG* and set the NCSG requirement information for that band;

6> else

7> include an entry for each supported *EUTRA* band in *interFreq-needForNCSG* and set the corresponding NCSG requirement information;

**[Comments]**: [MediaTek (Felix Tsai)]: As MGE RRC WI Rapp, mark this RIL as propAgree. Note that the indentation level should be modified.

**[RIL]**: H647 **[Delegate]**: (Huawei) Zheng Lili **[WI]**: **MGenh [Class]**: 1 **[Status]**: ToDo **[TDoc]**: None **[Proposed Conclusion]**:

**[Description]**: The format should be re-designed to increase readability

**[Proposed Change]**:

6> if *requestedTargetBandFilterNCSG-NR* is configured,

7> for each supported NR band included in *requestedTargetBandFilterNCSG-NR*, include an entry in *interFreq-needForNCSG* and set the NCSG requirement information for that band;

6> else

7> include an entry for each supported NR band in *interFreq-needForNCSG* and set the corresponding NCSG requirement information;

**[Comments]**: [MediaTek (Felix Tsai)]: As MGE RRC WI Rapp, mark this RIL as propAgree. Note that the indentation level should be modified.

**[RIL]**: H648 **[Delegate]**: (Huawei) Zheng Lili **[WI]**: **MGenh [Class]**: 1 **[Status]**: ToDo **[TDoc]**: None **[Proposed Conclusion]**:

**[Description]**: The format should be re-designed to increase readability

**[Proposed Change]**:

6> if *requestedTargetBandFilterNCSG-EUTRA* is configured,

7> for each supported NR band included in *requestedTargetBandFilterNCSG-EUTRA*, include an entry in *interFreq-needForNCSG* and set the NCSG requirement information for that band;

6> else

7> include an entry for each supported *EUTRA* band in *interFreq-needForNCSG* and set the corresponding NCSG requirement information;

**[Comments]**: [MediaTek (Felix Tsai)]: As MGE RRC WI Rapp, mark this RIL as propAgree. Note that the indentation level should be modified.

**[RIL]**: M601 **[Delegate]**: MediaTek (Felix Tsai) **[WI]**: MGenh **[Class]**: 1 **[Status]**: ToDo **[TDoc]**: None **[Proposed Conclusion]**:

**[Description]**: The Editor Note on measurement gap definition should be removed.

**[Proposed Change]**: Delete the Editor Note without changing of procedure text. The current definition on measurement gap is highly level enough and we think that introduction of pre-configured MG does not violate this definition. There is also no need to have details handling of measurement gap in the 5.5.1, which is for introduction.

**[Comments]**: [MediaTek (Felix Tsai)]: As MGE RRC WI Rapp, mark this RIL as propAgree.

**[RIL]**: H649 **[Delegate]**: (Huawei) Zheng Lili **[WI]**: **MGenh [Class]**: 1 **[Status]**: ToDo **[TDoc]**: None **[Proposed Conclusion]**:

**[Description]**: It should be guaranteed that the number of gaps in total does not exceed the limitation set by RAN4.

**[Proposed Change]**:

Add note: The gNB should ensure that the total number of gaps configured does not exceed *maxNrofGapId-r17* and follows the supported measurement gap combination defined in TS 38.133 [14].

**[Comments]**: [MediaTek (Felix Tsai)]: As MGE RRC WI Rapp, suggest to discuss this further in MGE session.

**[RIL]**: M607 **[Delegate]**: MediaTek (Felix Tsai) **[WI]**: **MGenh, PosEnh [Class]**: 2 **[Status]**: ToDo **[TDoc]**: R2-22xxxx **[Proposed Conclusion]**:

**[Description]**: Clarification on pre-configured positioning gap and pre-configured gap is needed

**[Proposed Change]**: Related to Z141 and H566. There is “pre-configured gap” introduced by MGE WI and “pre-configured positioning gap” from positioning WI. There are different activation/deactivation procedure for these two “pre-configured” gaps. Whether to harmonize ASN.1 code for the two gaps could be discussed. When to use which gap should also be discussed. In addition, there is an FFS point from MGE WI that “*FFS whether and how to capture the UE behavior on PRS measurements within measurement gaps when a Pre-configured MG is provided by the network (as indicated in RAN4 LS R4-2206789)*”. We will have a Tdoc to discuss the needed change.

**[Comments]**: [MediaTek (Felix Tsai)]: As MGE RRC WI Rapp, suggest to discuss this further in MGE session (For the FFS point). Note that the harmonization with ePOS gap is already concluded in Ad-Hoc meeting.

**[RIL]**: H650 **[Delegate]**: (Huawei) Zheng Lili **[WI]**: **MGenh [Class]**: 1 **[Status]**: ToDo **[TDoc]**: None **[Proposed Conclusion]**:

**[Description]**: If *deactivatedMeasGapList* is absent for all BWPs, it is unclear whether:

1) Case 4 is applied, and all gaps are activated; or

2) Case 5 is applied, and UE needs to determine the activation/deactivation state by its own.

**[Proposed Change]**:

Add a bitmap indicating the activated/deactivated status of all gaps in each BWP configuration.

**[Comments]**: [MediaTek (Felix Tsai)]: As MGE RRC WI Rapp, suggest to discuss this further in MGE session

**[RIL]**: M602 **[Delegate]**: MediaTek (Felix Tsai) **[WI]**: **MGenh [Class]**: 2 **[Status]**: ToDo **[TDoc]**: None **[Proposed Conclusion]**:

**[Description]**: The Editor Note on field *deactivatedMeasGapList* should be discussed.

**[Proposed Change]**: Delete the Editor Note without changing the ASN.1 code. Even if there is only one pre-configured gap configured, we can still assign an ID to the pre-configured gap and indicate whether it is deactivated in field *deactivatedMeasGapList*. We prefer to have gap ID mentioned explicitly in this field to avoid any potential misunderstanding between UE and NW.

**[Comments]**: [MediaTek (Felix Tsai)]: As MGE RRC WI Rapp, suggest to discuss this further in MGE session (together with H650)

**[RIL]**: H651 **[Delegate]**: (Huawei) Zheng Lili **[WI]**: **MGenh [Class]**: 1 **[Status]**: ToDo **[TDoc]**: None **[Proposed Conclusion]**:

**[Description]**: If rule-based activation/deactivation is applied, this field is also absent.

**[Proposed Change]**: The field is optionally present, Need R, if NW-controlled activation/deactivation is applied and there is at least one per UE gap configured with *preConfigInd* or there is at least one per FR gap of the same FR which the BWP belongs to and configured with *preConfigInd*. It is absent otherwise

**[Comments]**: [MediaTek (Felix Tsai)]: As MGE RRC WI Rapp, suggest to discuss this further in MGE session (together with H650).

**[RIL]**: I020 **[Delegate]**: Intel (Sudeep) **[WI]**: **MGenh**  **[Class]**: 1 **[Status]**: ToDo **[TDoc]**: None **[Proposed Conclusion]**: v045

**[Description]**: Missing Need code for absence that is relevant here.

**[Proposed Change]**: Add Need R

**[Comments]**: [MediaTek (Felix Tsai)]: As MGE RRC WI Rapp, mark this RIL as propAgree.

**[RIL]**: M603 **[Delegate]**: MediaTek (Felix Tsai) **[WI]**: **MGenh [Class]**: 2 **[Status]**: ToDo **[TDoc]**: None **[Proposed Conclusion]**:

**[Description]**: The Editor Note on field *deactivatedMeasGapList* should be discussed.

**[Proposed Change]**: Same as M602. Delete the Editor Note without changing the ASN.1 code. Even if there is only one pre-configured gap configured, we can still assign an ID to the pre-configured gap and indicate whether it is deactivated in field *deactivatedMeasGapList*. We prefer to have gap ID mentioned explicitly in this field to avoid any potential misunderstanding between UE and NW.

**[Comments]**: [MediaTek (Felix Tsai)]: As MGE RRC WI Rapp, suggest to discuss this further in MGE session (together with H650)

**[RIL]**: I023 **[Delegate]**: Intel (Sudeep) **[WI]**: **MGenh [Class]**:1 **[Status]**: ToDo **[TDoc]**: None **[Proposed Conclusion]**: v045

**[Description]**: Need code for absence seems relevant here.

**[Proposed Change]**: Add Need R

**[Comments]**: [MediaTek (Felix Tsai)]: As MGE RRC WI Rapp, mark this RIL as propAgree.

**[RIL]**: Z141 **[Delegate]**: ZTE (LiuJing) **[WI]**: PosEnh, MGenh **[Class]**: 2 **[Status]**: ToDo **[TDoc]**: xxx **[Proposed Conclusion]**:

**[Description]**: Although R17 preconfigured gap can be configured for positioning, once one PosEnh gap is activated, we think it is same as the PosEnh gap configured in R16, and one gap can be used for both positioning measurement and normal RRM measurement. So we think there is no need to define separate “addModList” for positioning, it is better to use a unified signalling for both R17 positioning gap and MGE. Otherwise, it is hard to capture the association between the two structures.

**[Proposed Change]**: Delete these two IEs, and reuse gapUEToAddModList-r17 to provide pre-configured PoS gap configurations, we will bring discussion paper for this issue.

[MediaTek (Felix Tsai)] We are not sure the pre-configured positioning gap could be used for normal measurement, which we believe that this depends on R4 requirement. However, we do support using harmonized ASN.1 structure for gaps for gaps from MGE and pre-configured positioning gap. We will also bring a contribution to this.

**[Comments]**: [MediaTek (Felix Tsai)]: As MGE RRC WI Rapp, it is suggested to discuss the final CR in positioning session based on the agreement made in Ad-Hoc meeting.

**[RIL]**: H581 **[Delegate]**: (Huawei) Guo Yinghao **[WI]**: Multi **[Class]**: 1**[Status]**: ToDo **[TDoc]**: Yes **[Proposed Conclusion]**:

**[Description]:**In MGenh, the measGapConfig can already associate a MG to a PRS. We should reuse the signalling introduced in MGenh for positioning.

[Proposed change]: change to MeasGapConfig

**[Comments]**: [MediaTek (Felix Tsai)]: As MGE RRC WI Rapp, it is suggested to discuss the final CR in positioning session based on the agreement made in Ad-Hoc meeting. (Note that I think it is not so related to MGE)

**[RIL]**: H652 **[Delegate]**: (Huawei) Zheng Lili **[WI]**: **MGenh [Class]**: 1 **[Status]**: ToDo **[TDoc]**: None **[Proposed Conclusion]**:

**[Description]**: If the maximum numbers of FR1 gaps, FR2 gaps and per UE gaps are all set to *maxNrofGapId-r17*, the total number will exceed *maxNrofGapId-r17*. The restriction should be set per gap type.

**[Proposed Change]**: Change *maxNrofGapId-1-r17* to *maxNrofGapIdPerType-1-r17*. And add *maxNrofGapIdPerType-1-r17* into “Multiplicity and type constraint definitions”

**[Comments]**: [MediaTek (Felix Tsai)]: As MGE RRC WI Rapp, suggest to discuss this further in MGE session (together with E033/E034)

**[RIL]**: E033 **[Delegate]**: Ericsson (Felipe) **[WI]**: MGenh **[Class]**: 2 **[Status]**: ToDo **[TDoc]**: None **[Proposed Conclusion]**:

**[Description]**: Duplicate *GapConfig* into a new R17 element, and instead, add to the latter the R17 features/configurations.

**[Proposed Change]**: Create a separate IE (e.g., *GapConfig-r17)* to restrict legacy configuration to include R17 MGenh features. Hence, we avoid modifying *GapConfig* (i.e., remove the extensions proposed by the MGE CR). Instead, we duplicate the fields in *GapConfig* it into a new IE which also includes the R17 features.

**[Comments]:** [MediaTek (Felix Tsai)]: As MGE RRC WI Rapp, suggest to discuss this further in MGE session

**[RIL]**: E034 **[Delegate]**: Ericsson (Felipe) **[WI]**: MGenh **[Class]**: 2 **[Status]**: ToDo **[TDoc]**: None **[Proposed Conclusion]**:

**[Description]**: Address the fact that the *measGapId* should be local to each “gap type” (i.e., per UE/FR1/FR2 gaps)

**[Proposed Change]**: Have a single ToAddModList to enable concurrent gaps, instead of the 3 new ToAddModList for each “gap type” in the current version of the spec. Considering RIL E033, *GapConfig-r17* would then also include the gap type (i.e., perFR1, perFR2, or perUE) as a configuration parameter/attribute.

**[Comments]**: [MediaTek (Felix Tsai)]: As MGE RRC WI Rapp, suggest to discuss this further in MGE session

**[RIL]**: C100 **[Delegate]**: CATT (Shijie) **[WI]**: MGenh **[Class]**: 1**[Status]**: ToDo **[TDoc]**: None **[Proposed Conclusion]**:

**[Description]**: According to the following description in TS 38.133, only higher priority is mentioned.

In case of collision between two measurement gap occasions, the UE shall perform measurements in the occasion of the measurement gap with higher priority, and the occasion of the measurement gap with lower priority is considered to be dropped. The UE shall be able to transmit PUCCH/PUSCH/SRS or receive PDCCH/PDSCH/TRS/CSI-RS for CQI in the corresponding NR serving cells in the slots that are not interrupted according to requirements in clause 9.1.2B.4.

And in RAN4 latest LS (R2-2203844/R4-2206788), it was agreed:

o In Rel-17, define requirements for the case when different measurement gaps are configured with different priorities (i.e., do not consider equal priorities case)

**[Proposed Change]**:

The description of *gapPriority* changes to:

Indicate the priority of this measurement gap ~~(see TS 38.133 [14], clause FFS)~~. *Value 1* indicates highest priority, *value* 2 indicates second level priority, and so on. In each collision, the UE will perform only measurements associated with the measurement gap with the highest priority (see TS 38.133 [14], clause FFS). In Rel-17, define requirements for the case when different measurement gaps are configured with different priorities (i.e., do not consider equal priorities case).

**[Comments]**: [MediaTek (Felix Tsai)]: As MGE RRC WI Rapp, suggest to discuss this further in MGE session (But think this is not urgent)

**[RIL]**: M604 **[Delegate]**: MediaTek (Felix Tsai) **[WI]**: **MGenh [Class]**: 1 **[Status]**: ToDo **[TDoc]**: None **[Proposed Conclusion]**:

**[Description]**: Conditional presence for gap ID should be discussed.

**[Proposed Change]**: Delete the conditional code GapID, change to simple Need R for field *measGapId-r17*. The current description on conditional presence of the gap ID is a little bit over specified. If the gap ID is also used for positioning pre-configured gap, additional case should be added. We think this could just leave to reasonable NW implementation.

**[Comments]**: [MediaTek (Felix Tsai)]: As MGE RRC WI Rapp, suggest to discuss this further in MGE session (together with E033/E034)

[Samsung] We think that the field will need some condition.

For e.g. This field needs to be mandatory present when gaps are added using gapUEToAddModList or gapFR1ToAddModList-r17 or gapFR2ToAddModList-r17. Otherwise gapUEToReleaseList-r17/gapFR1ToReleaseList-r17/gapFR2ToReleaseList-r17 will not work properly.

This can be further discussed using a t-doc during #118-e, as it is already included in the agenda of #118-e.

**[RIL]**: H653 **[Delegate]**: (Huawei) Zheng Lili **[WI]**: **MGenh [Class]**: 1 **[Status]**: ToDo **[TDoc]**: None **[Proposed Conclusion]**:

**[Description]**: If absent, the UE behaviour is unclear. Same comment to both *associatedMeasGapSSB* and *associatedMeasGapCSIRS*.

**[Proposed Change]**: Add a conditional presence. The condition is similar to the “Cond GapID” for *measGapId-r17*.

**[Comments]**: [MediaTek (Felix Tsai)]: As MGE RRC WI Rapp, suggest to discuss this further in MGE session

**[RIL]**: Z142 **[Delegate]**: ZTE (LiuJing) **[WI]**: MGenh **[Class]**: 1 **[Status]**: ToDo **[TDoc]**: xxx **[Proposed Conclusion]**:

**[Description]**: The relationship between *deriveSSB-IndexFromCellInter* and *deriveSSB-IndexFromCell* has been discussed in RAN2\_117e but no conclusion was made. As we know, RAN4 will not discuss this issue, and it is up to RAN2 to discuss it and fix it in order to avoid IoT problem between NW and UE. There are two options on the table:

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.

For simplicity, we suggest to adopt Option 2.

**[Proposed Change]**: Add “When this field is configured, the UE ignores the *deriveSSB-IndexFromCell*” to the field description.

[MediaTek (Felix Tsai)] It is not clear to us what does UE ignore means, our preference is option 1. Maybe we can also send LS to ask R4 on this aspect.

**[Comments]**: [MediaTek (Felix Tsai)]: As MGE RRC WI Rapp, suggest to discuss this further in MGE session

**[RIL]**: I031 **[Delegate]**: Intel (Sudeep) **[WI]**: **MGenh [Class]**: 2 **[Status]**: ToDo **[TDoc]**: None **[Proposed Conclusion]**: v045

**[Description]**: No Need to define as optional. The IE is always used in a setupRelease structure and there is only one field

**[Proposed Change]**: make mandatory

**[Comments]**: [MediaTek (Felix Tsai)]: As MGE RRC WI Rapp, mark this RIL as propReject. (The NW could enable this feature without providing the band filter, which implies that the UE provide gap requirement information for all supported bands)

**[RIL]**: I032 **[Delegate]**: Intel (Sudeep) **[WI]**: **MGenh** **[Class]**: 2 **[Status]**: ToDo **[TDoc]**: None **[Proposed Conclusion]**: v045

**[Description]**: No Need to define as optional. The IE is always used in a setupRelease structure and there is only one field

**[Proposed Change]**: make mandatory

**[Comments]**: [MediaTek (Felix Tsai)]: As MGE RRC WI Rapp, mark this RIL as propReject. (The NW could enable this feature without providing the band filter, which implies that the UE provide gap requirement information for all supported bands)

**[RIL]**: I033 **[Delegate]**: Intel (Sudeep) **[WI]**: **MGenh** **[Class]**: 1 **[Status]**: ToDo **[TDoc]**: None **[Proposed Conclusion]**: v045

**[Description]**: There is no need to have define this IE here. Can directly use the list.

**[Proposed Change]**: replace the field with needForNSCG-BandListEUTRA-r17 and delete the NeedForNSCG-BandListEUTRA-r17

**[Comments]**: [MediaTek (Felix Tsai)]: As MGE RRC WI Rapp, mark this RIL as propAgree

**[RIL]**: M605 **[Delegate]**: MediaTek (Felix Tsai) **[WI]**: MGenh **[Class]**: 2 **[Status]**: ToDo **[TDoc]**: None **[Proposed Conclusion]**:

**[Description]**: Maximum number of measurement gap ID to be discussed.

**[Proposed Change]**: Define maxNrofGapId-r17 as 8 and define maxNrofGapId-1-r17 as 7. For concurrent gap introduced in MGE, only one more gap pattern is needed. However, for future proof and also reusing this for positioning pre-configured gaps (see Z141), a larger value is preferred. We suggest to use value 8.

**[Comments]**: [MediaTek (Felix Tsai)]: As MGE RRC WI Rapp, suggest to discuss this further in MGE session (together with E033/E034)

**[RIL]**: M606 **[Delegate]**: MediaTek (Felix Tsai) **[WI]**: MGenh **[Class]**: 2 **[Status]**: ToDo **[TDoc]**: None **[Proposed Conclusion]**:

**[Description]**: Maximum number of gap priority to be discussed.

**[Proposed Change]**: Define the maximum number of gap priority to 8. Gap priority is used for R4 requirement in case there is collision between two configured measurement gaps. In R17, R4 LS indicates 2 priority level is enough and suggest to define the maximum value as 5. Here we think that we can use value 8 for future proof.

**[Comments]**: [MediaTek (Felix Tsai)]: As MGE RRC WI Rapp, suggest to discuss this further in MGE session (together with E033/E034)

**In summary**

The following RILs are suggested to be agreed.

* H645/H646/H647/H648 - The format should be re-designed to increase readability
* M601 – Remove editor note on MG definition
* I020/I023 – Missing Need code for absence that is relevant here.
* I033 – Replace the field with needForNSCG-BandListEUTRA-r17 and delete the NeedForNSCG-BandListEUTRA-r17

The following RILs are suggested to be rejected.

* I031/I032 – Make band filter mandatory

The following RILs are suggested to be further discussed in positioning session (or in general section) based on the agreement from Ad-Hoc meeting

* Z141/H581

The following RILs are suggested to be discussed in MGE session.

* Class 2
  + E033/E034/H652/M604/M605/M606 - *ToAddModList* and Gap ID
  + H650/H651/M602/M603 – Configuration of *deactivatedMeasGapList*.
* Class 1
  + H653 – Conditional code of *associatedMeasGapSSB* and *associatedMeasGapCSIRS*.
  + H649 – Add note: The gNB should ensure that the total number of gaps configured does not exceed maxNrofGapId-r17 and follows the supported measurement gap combination defined in TS 38.133
  + M607 – FFS whether and how to capture the UE behavior on PRS measurements within measurement gaps when a Pre-configured MG is provided by the network (as indicated in RAN4 LS R4-2206789)
  + Z142 – relationship between *deriveSSB-IndexFromCellInter* and *deriveSSB-IndexFromCell*
  + C100 – Field description of *gapPriority*

**Companies are invited to provide their comment (if any) on how to handle the RILs.**

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| **Company** | **RIL** | **Comments** |
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# 3 Conclusions

Base on the discussion in section 2, we propose the following:

**Proposal 1: Agree the intention of the following MGE RILs and handle this in MGE Rapp’s CR**

* **H645/H646/H647/H648**
* **M601**
* **I020/I023**
* **I033**

**Proposal 2: The following MGE RILs are rejected**

* **I031/I032**

**Proposal 3: To discuss the following RILs in MGE session**

* **Class 2**
  + **E033/E034/H652/M604/M605/M606 - *ToAddModList* and Gap ID**
  + **H650/H651/M602/M603 - Configuration of *deactivatedMeasGapList*.**
* **Class 1**
  + **H653 – Conditional code of *associatedMeasGapSSB* and *associatedMeasGapCSIRS*.**
  + **H649 – Add note: The gNB should ensure that the total number of gaps configured does not exceed maxNrofGapId-r17 and follows the supported measurement gap combination defined in TS 38.133**
  + **M607 – FFS whether and how to capture the UE behavior on PRS measurements within measurement gaps when a Pre-configured MG is provided by the network (as indicated in RAN4 LS R4-2206789)**
  + **Z142 – relationship between *deriveSSB-IndexFromCellInter* and *deriveSSB-IndexFromCell***
  + **C100 – Field description of *gapPriority***

# 4 References

[1]