[97e-25-R18-MeasGapEnh.] - Version 0.0.3
RAN

3GPP TSG-RAN Meeting #97e RP-222581

Electronic Meeting, 12 – 26 September 2022

Agenda item: 9.3.4.7

Source: Moderator (MediaTek inc.)

Title: Moderator's summary for discussion [97e-25-R18-MeasGapEnh]

Document for: Information

1 Introduction

This is the NWM discussion for Email thread [97e-25-R18-MeasGapEnh.] in RAN Plenary #97e meeting.

The involved Tdocs are:

- RP-222336, Views on scope of Rel-18 further MG enhancement, MediaTek inc.
- RP-222337, Revised WI: Further Enhancements on NR and MR-DC Measurement Gaps and Measurements without Gaps, MediaTek inc. (not submitted)
- RP-222356, Revised WID on Further Enhancements on NR and MR-DC Measurement Gaps and Measurements without Gaps, Intel Corporation, MediaTek Inc.
- RP-222426, Motivation of WID revision for Further enhancements on NR and MR-DC measurement gaps and measurements without gaps, Apple

2 Initial round

The main point of discussion is regarding the proposals on how to revise Case 1 and Case 2 of Objective 1 in the WID. There 2 options suggested in RP-222336 and RP-222426, as captured below

- Option 1: (Proposal from RP-222336)
  - Case 1: Pre-configured MGs and multiple concurrent MGs (i.e., concurrent MGs where at least one of the gaps is a pre-configured gap **and none of them is NCSG or is used for NTN or MUSIM**)
  - Case 2: NCSG and multiple concurrent MGs (i.e., concurrent MGs where at least one of the gaps is NCSG **and none of them is pre-configured MG or is used for NTN or MUSIM**)

- Option 2: (Proposal from RP-222426)
  - Case 1: Pre-configured MGs and multiple concurrent MGs (i.e., concurrent MGs where at least one of the gaps is a pre-configured gap**, the other gap can be a pre-configured gap, an NCSG or a legacy gap**)
  - Case 2: NCSG and multiple concurrent MGs (i.e., concurrent MGs where at least one of the gaps is NCSG**, the other gap can be a pre-configured gap, an NCSG or a legacy gap**)

Please note that Case 1 and Case 2 are only for the prioritized combinations. For other combinations that are not mentioned in Case 1 and Case 2, they are still allowed to be discussed after the discussions for Case 1 and Case 2 are stable.

In this initial round, let's first collect views from companies about above 2 options.

Feedback Form 1: Collect views to the 2 options for WID revision

1 – Ericsson LM We support Option 1. RAN4 should first define requirements for case 1 and case 2 in Option 1. These are more fundamental scenarios. Scenarios in Option 2 are more complicated and can be considered in second phase of the WI after scenarios in Option 1 are completed.
2 – MediaTek Inc. Support Option 1. We prefer to proceed the work step-by-step. So that RAN4 discussions can be more focused and more efficient. This can also help to achieve better spec quality and reduce delegate efforts. Solid conclusions for simpler scenarios are also the key to move forward to other more complicated scenarios. Once the fundamental scenarios are concluded, they can be used as the foundation for other more complicated scenarios.
3 – Apple GmbH Support option 2 with modification to preclude NTN gap and MUSIM. According to RAN4#104 discussion, 7 companies support to define requirements for Pre-MG + NCSG. In our understanding it would be a practical scenario. From work load point of view, so far we don't see significant extra effort to support Pre-MG + NCSG on top of Pre-MG + legacy gap and NCSG + legacy gap. Regarding NTN gap and MUSIM gap, we share same view as proponents of option 1 that we don't need to consider them in case 1 and 2.
4 – Beijing Xiaomi Mobile Software Support option 2. We share the similar view as Apple, the combination of Pre-MG + NCSG is a typical scenario. For UE supporting NCSG, NW can configure pre-MG + NCSG to further reduce the scheduling

gap of serving cell compared with the existing configuration of case 2. and from requirement point of view, we don't see much extra effort to support this case.

5 – Samsung Electronics Co.

We prefer to preclude MUSIM and NTN gaps regardless option 1 or option 2.

We slightly prefer option 1 in initial phase and Option 2 also acceptable under the condition, no addtional TU required with the assumption that the impact /addtional effort is managable.

6 – Guangdong OPPO Mobile Telecom.

Option 1 is fine to us. We can start from option 1 at this stage and only consider joint NCSG+ legacy gap in case 2.

But some further clarification is needed for case 2 in both option 1 and option 2. For case 2, we wonder whether NCSG+NCSG is a feasible scenario as NCSG is assumed as one concurrent gap here. If we agreed to include NCSG+NCSG as concurrent gaps, then it seem hard to preclude Pre-MG+NCSG because it was agreed to support Pre-MG+ one concurrent gap.

7 – Huawei Technologies France

We slightly prefer Option 2. The wording in the proposal may need more discussion because "legacy gap" may be interpreted to include all kinds of gaps defined up to Rel-17. A note can be added to interpret the "legacy gap".

Note: a "Legacy MG" means a measurement gap configured via GapConfig (without suffix).

8 – CATT

We support option 1. Pre-MG, concurrent MG and NCSG are three independent features. When we say the combination of Pre-MG and concurrent MG in case 1, there is nothing related to the NCSG and we should not mix them up. We are also fine to study the scenario of Pre-MG + NCSG, but it is the combination of all three features and should be studied at the later stage of this WI after the basic requirements (Pre-MG + concurrent MG and concurrent MG + NCSG) completed.

During the discussion of the WI scope, when we say at least one of them is pre-MG in case 1, we understand the intention is to include the case of Pre-MG + Pre-MG rather than consider NCSG.

9 – ZTE Wistron Telecom AB

Option 1. We should work on the fundamental scenarios at first.

10 – QUALCOMM JAPAN LLC.

We support Option 1. IT would be good to have this clarification and streamline the RAN4 work. If the work is finalized and there will be time available, more complicated scnearios like those in Option 2 can be worked on.

11 – LG Electronics Polska

We are fine with option 1, but we are open to option 2 scenarios. If there is no highly work load for option 1 scenario, RAN4 can start a discussion on option 2 after option 1 is stable in Rel-18 time frame. for option 2, need to clarify the meaning of "legacy MG".

Whether the "legacy MG" is Rel-17 MG only or up to Rel-17 MG (including MG without priority)

12 – vivo Mobile Communication (S)

From wording perspective, option 2 is slightly preferable as it clearly states what is in the scope and what is not.

For option 1, our interpretation is:

Case 1 would be pre-MG + pre-MG, pre-MG + legacy gap, pre-MG + Gap for PRS measurement for positioning, per-MG + ePoS gap.

13 – vivo Mobile Communication (S)

The previous unfinished feedback was sent out accidently.

From wording perspective, option 2 is slightly preferable as it clearly states what is in the scope and what is not.

For option 1, our interpretation is:

Case 1 would be pre-MG + pre-MG, pre-MG + legacy gap, pre-MG + Gap for PRS measurement for positioning, per-MG + ePoS gap.

Case 2 would be NCSG + legacy gap, NCSG + Gap for PRS measurement for positioning, NCSG + ePoS gap

If this is the cases, it would be better to list the combinations clearly for the clarity of the scope.

Regarding pre-MG + NCSG, we are fine to study in RAN4 if requirements are to be specified.

If the purpose of the WID revision is to preclude something, it would be better to add a note. Other parts can still be discussed in RAN4.

14 – vivo Mobile Communication (S)

The previous unfinished feedback was sent out accidently.

From wording perspective, option 2 is slightly preferable as it clearly states what is in the scope and what is not.

For option 1, our interpretation is:

Case 1 would be pre-MG + pre-MG, pre-MG + legacy gap, pre-MG + Gap for PRS measurement for positioning, per-MG + ePoS gap.

Case 2 would be NCSG + legacy gap, NCSG + Gap for PRS measurement for positioning, NCSG + ePoS gap

If this is the cases, it would be better to list the combinations clearly for the clarity of the scope.

Regarding pre-MG + NCSG, we are fine to study in RAN4 if requirements are to be specified.

If the purpose of the WID revision is to preclude something, it would be better to add a note. Other parts can still be discussed in RAN4.

15 – China Mobile Com. Corporation

Support option 2. We are also OK to modify option 2 to preclude gaps for NTN and MUSIM. We do not see the necessity to preclude the combination of Pre-MG + NCSG. We do not see too much extra work is needed to support Pre-MG + NCSG. Could proponent of option 1 to clarify why Pre-MG + NCSG is precluded?

16 – Nokia Corporation

We support clarifying the scope of the objective Enhancements of pre-configured MGs, multiple concurrent MGs and NCSG.

We agree with the intention of Option 1, however we think that the proposal needs further clarifications.

We would propose an alternative text which we see would clarify our understanding of the scope of the objective:

- Enable simultaneous configuration of Pre-MG and NCSG pattern and a Rel-17 concurrent gap pattern.

It may be better to clarify what is included within the scope of the objective instead of listing what is not within the scope of the objective.

We are fine to focus the initial part of the work such that RAN4 defines requirements for concurrent measurement gaps assuming one of the configured measurement gaps is either a Pre-MG or an NCSG measurement gap pattern.

We also see the point from Apple proposal (RP-222426) to include legacy gaps in the discussion. Therefore, we think it is better to include it as a separate objective. We propose Option 3 (underlined text is updated text. Note: Sub-bullets 3, 4 and 5 should be same level as sub-bullet 2):

Option 3 (new):

- Define RRM requirements for UEs configured with a combination of pre-configured MGs, and/or multiple concurrent MGs and/or NCSG [RAN4]
    - Case 1: A Pre-configured MG~~s~~ and ~~multiple~~ concurrent MGs, ~~(~~i.e., the network has provided the UE with multiple measurement gap patterns where one gap pattern is a Pre-configured MG pattern~~concurrent MGs where at least one of the gaps is a pre-configured gap)~~
- o Case 2: An NCSG and ~~multiple~~ concurrent MGs, ~~(~~i.e., the network has provided the UE with multiple measurement gap patterns where one gap pattern is a NCSG pattern~~concurrent MGs where at least one of the gaps is NCSG)~~
- Note: Concurrent MG in the above bullets refer to Rel-17 Concurrent MG.
- Note: This WID does not include measurement gaps that are specified in other WIDs, such as MUSIM and NTN.

- Define RRM requirements for UEs configured with a combination of Rel-17 concurrent MG patterns colliding with a legacy MG pattern.

17 – Intel Corporation (UK) Ltd

We support option 1.

It is preferable to keep RAN4 discussion focused by prioritising certain cases to discuss first. This does not preclude other cases being discussed later in the WI if time allows.

3 Intermediate Round

Summary of the initial round discussion

- There were totally 15 companies providing inputs in the initial round discussions. 10 companies preferred Option 1. 5 companies preferred Option 2. More discussions are needed in the intermediate round.
- No company raised the concern to preclude gaps for NTN and MUSIM from Case 1 and Case 2. Moderator will put this point to be confirmed in the intermediate round.
- Huawei and LGE suggested to further clarify the definition of 'legacy gap'. RAN4 had some similar discussions in Aug. Moderator will arrange an issue in intermediate round to see if we can achieve some quick consensus. If no, Moderator suggests not mentioning legacy gap in the WID to avoid confusion.
- CMCC asked why Pre-MG+NCSG is precluded in the WI. Moderator's understanding is that precluding it in Case 1 and Case 2 does not mean they are not precluded in the WI. The whole discussion is only about which combinations to be discussed first in the WI.
- Vivo suggested to explicitly list all kind of combinations to be discussed in the scope, including gaps for POS measurement and ePOS gaps. Moderator thinks the first one was already confirmed in last RAN4 meeting, while the 2nd one is still open. (Please check Issue 2-8 of R4-2214346) Therefore, Moderator will arrange a discussion in 2nd round to collect views on ePOS gap. If no quick consensus can be achieved in the intermediate round, Moderator suggests not to mention ePOS gap in the WID and leave it to RAN4 to decide.
- Nokia provided a revised sentence of the WID. Moderator thinks the sentences are good, and will take them as the basis in the later discussions.

3.1 Gaps for NTN and MUSIM purposes

The Option 1 from RP-222336 was to preclude NTN and MUSIM from Case 1 and Case 2 (i.e., they are still in the scope but with lower priority). In the initial round discussion, Nokia's Option 3 is to preclude them form the WI. According to RAN4 agreement in Issue 2-5 of R4-2214346, MUSIM gap is already confirmed to be out of scope of this WI. Therefore, Moderator invites companies to confirm which direction we should go regarding gaps for NTN.

- **Option A-1**: Gaps that are configured for NTN are precluded in Case 1 and Case 2

– **Option A-2**: Gaps that are configured for NTN are precluded in the WI

Feedback Form 2: Gaps for NTN and MUSIM purposes

1 – Guangdong OPPO Mobile Telecom. Support option A-1. For option A-2, it is open and depends on the WI progress.
2 – CATT Support option A-2. There are some differences between the frameworks of NTN gap and the gaps in this WI. It will make the scenarios more complicated if mixing them up.
3 – CATT Support option A-2. There are some differences between the frameworks of NTN gap and the gaps in this WI. It will make the scenarios more complicated if mixing them up.
4 – LG Electronics Polska We don't have a strong view, but slightly prefer option A-2.
5 – China Mobile Com. Corporation Both options are OK for us.
6 – Huawei Technologies France We prefer option A-1. RAN4 may consider joint working between NTN MGs and other MGs. Of course, this is not included in the current WI scope, and requires discussion and agreement in future RAN meetings. However, there is no need to preclude NTN MGs from the WI at this stage.
7 – vivo Mobile Communication (S) We are fine with both options.
8 – MediaTek Inc. Both options are fine to us.
9 – Apple GmbH We slightly prefer option A-1. Joint configuration of NTN gaps and other gaps could be beneficial in certain scenario. We consider it as low priority in this WI. however, we don't think RAN4 needs to preclude at current stage.
10 – Beijing Xiaomi Mobile Software We prefer option A-1, for UE supporting NTN feature, the configuration of NTN gap and other MGs is the possible use case. RAN4 can discuss this case in later stage if the RAN4 has conclusion for case 1 and case 2, so we prefer not to preclude this use case in current stage.

11 – Intel Corporation (UK) Ltd We can be open to both options.
12 – Nokia Corporation Option A-2: Current WID does not mention NTN gaps, and this means NTN is not included in WI. Based on the current discussion we prefer to continue the WI work without including NTN gaps.

3.2 ePOS gap

Companies are invited to provide views on whether ePOS gap should be considered in Case 1 and Case 2.

- **Option B-1**: ePOS gaps are considered in Case 1 and Case 2
- **Option B-2**: ePOS gaps are not considered in Case 1 and Case 2

If no quick consensus can be achieved in the intermediate round, Moderator suggests not to mention ePOS gap in the WID and leave it to RAN4 to decide.

Feedback Form 3: ePOS gap

1 – Guangdong OPPO Mobile Telecom. Prefer Option B-2. Also fine with moderator‘s suggestion□we do not mention ePOS gap and similar disucussion can be left to RAN4.
2 – CATT Support B-2.
3 – China Mobile Com. Corporation Prefer Option B-2. According to the objectives of WID, it is clearly stated that the enhancements are for pre-configured MGs, multiple concurrent MGs and NCSG, which means ePOS gaps are not considered.
4 – Huawei Technologies France Support option B-2. We understand ePOS gap is not same as any of the pre-MG, con-MG or NCSG.
5 – MediaTek Inc. Support Option B-2. We believe that ePOS gap was not considered when we approved the WI in this March.

6 – vivo Mobile Communication (S) We rasied this based on interpretation of optoin 1 in the initial round that except MUSIM gaps and NTN gaps all other gaps are in the scope of the WID. It seems not the case based on further comments. Then, we prefer to leave it to RAN4 for further discussion.
7 – Apple GmbH Prefer option B-2. ePos gap can be considered in the WID. however, it should be with lower priority than other combination, such Pre-MG + NCSG as supported by several companies.
8 – Beijing Xiaomi Mobile Software We support option B-2.
9 – Nokia Corporation We can agree to option B-2. Our preference is to consider ePOS gaps but it can be done separate from Case 1 and Case 2

3.3 Definition of legacy gap

In the initial round, Huawei suggested to clarify that ”Legacy MG” means a measurement gap configured via GapConfig (without suffix). Moderator wonders whether this means that legacy gap does not include GapConfig-r17 that are not configured as Pre-MG or NCSG? Companies are encourage to provide views on the following definitions of ’legacy gap’

- Definition of legacy gap
  - **Option C-1**: Gap(s) configured via GapConfig (without suffix)
  - **Option C-2**: Gap(s) not configured as Pre-MG/NCSG (with or without suffix)
  - **Option C-3**: Gap(s) not configured as Pre-MG/NCSG or not intended for NTN/MUSIM (with or without suffix)
  - **Option C-4**: Others

If no quick consensus can be achieved in the intermediate round, Moderator suggests not mentioning legacy gap in the WID to avoid confusion.

Feedback Form 4:

1 – Guangdong OPPO Mobile Telecom. Option C-1 is also our understanding.
2 – CATT Our understanding is option C-1.

3 – LG Electronics Polska

We think legacy gap is option C-1.

4 – China Mobile Com. Corporation

In our understanding, legacy gaps are the gaps defined before Rel-17, which means the gaps introduced in Rel-17, e.g. MUSIM, Pre-MG, NCSG, POS gaps, are not considered. From this point of view, Option C-1 is preferred.

5 – QUALCOMM JAPAN LLC.

Our understanding is that legacy gap correspond to Option C-1.

6 – QUALCOMM JAPAN LLC.

Our understanding is that legacy gap correspond to Option C-1.

7 – Huawei Technologies France

We support option C-1 for terminology. In our view there may be a need to differ MG configured via GapConfig and that configured via GapConfig-r17 (but not configured as Pre-MG or NCSG) because the former does not have MG ID or priority configured, and that may cause some differences in the requirements. Perhaps we can term “legacy gap” with option C-1 and term MG configured via GapConfig-r17 (but not configured as Pre-MG or NCSG) as “R17 normal gap” or something else.

Technically, both “legacy gap” and “R17 normal gap” should be included in Case 1 and Case 2.

8 – vivo Mobile Communication (S)

Legacy gap should be defined as option C-1.

9 – Apple GmbH

We are fine with using option C-1 to clarify the terminology. However, when proposing option 2 in the initial round, by saying ”legacy gap” we were referring to both C-1 and C-3. Even in the original case 1 and 2, in our understanding NW can also provide priority, MO association to the 2nd gap (assuming the 1st gap is Pre-MG in case 1 or NCSG in case 2).

10 – Beijing Xiaomi Mobile Software

Option C-1 is aligned with our understanding.

11 – Intel Corporation (UK) Ltd

We would prefer to avoid defining a new terminology. It is better to just be clear in the WID what we mean based on well understood existing terms.

12 – Nokia Corporation

Option C-1 is our understanding of what is understood by legacy gaps

3.4 Order of requirement discussions for combinations of Pre-MG/NCSG + concurrent gap

From Moderator's observation. one potential misunderstanding could be that : some companies may think precluding a combination from Case 1 and Case 2 means precluding this combination in the WI. We should avoid this misunderstanding in the WID.

As there are still a majority of companies preferring Option 1, Moderator suggests going with Option 1 but add a clear milestone for RAN4 to start discussing other more complicated scenarios. Please companies check if the following revised Objective #1 is OK or not **as a compromise**. Note that the conclusions in Section 3.1, 3.2 and 3.3 may be added into the proposal later, if there is a clear consensus.

Proposal 1:

- Case 1: Pre-configured MGs and concurrent MGs (i.e., the network has provided UE with multiple measurement gap patterns where one gap pattern is a Pre-configured MG)
- Case 2: NCSG and concurrent MGs (i.e., the network has provided UE with multiple measurement gap patterns where one gap pattern is a NCSG)
- Note: Before RAN#[99], the requirement discussions focus on the scenarios that NCSG is not considered in Case 1 and that Pre-configured MG is not considered in Case 2
- Note: This WID does not include measurement gaps that are configured for MUSIM purpose.

Feedback Form 5: Order of requirement discussions for combinations of Pre-MG/NCSG + concurrent gap

1 – Guangdong OPPO Mobile Telecom. Generally fine with moderator's wayforward, but also prefer to explicitly list all combinations to be discussed for case 1 and case 2 in order to avoid further confusion. For example, whether NCSG+NCSG is considered in case 2.
2 – CATT Generally fine with the structure of proposal 1. And share the same view as OPPO that it would be better to clarify whether Pre-MG+Pre-MG is included in case 1 and whether NCSG+NCSG is included in case 2.
3 – QUALCOMM JAPAN LLC. We are fine with the proposal. It is not clear if a milestone to start discussion on case2 is useful, what if discussion on case 1 is not finalized?
4 – China Mobile Com. Corporation Thanks moderator for the clarification that precluding a combination from Case 1 and Case 2 does not mean precluding this combination in the WI. However, we do not understand why the combination of Pre-MG+NCSG is considered as more complicated, since not too much additional work is observed. From our point of view, Pre-MG+NCSG has the same priority with other combinations in case 1/case 2, and can be considered together.

As for the suggestion with milestone. In general, to move forward, we can compromise with this approach. But according to the experience in earlier releases, the work with lower priority may be dropped at the end. To avoid this situation, it is better to use this milestone to start discussing other scenarios. Based on this consideration, proposal 1 is updated as following (the updated part is highlighted in italic):

Updated Proposal 1:

- Case 1: Pre-configured MGs and concurrent MGs (i.e., the network has provided UE with multiple measurement gap patterns where one gap pattern is a Pre-configured MG)

- Case 2: NCSG and concurrent MGs (i.e., the network has provided UE with multiple measurement gap patterns where one gap pattern is a NCSG)

Note: ~~Before RAN#[99], the requirement discussions focus on the scenarios that NCSG is not considered in Case 1 and that Pre-configured MG is not considered in Case 2~~ T*he requirement discussions on the scenarios that NCSG is considered in Case 1 and that Pre-configured MG is considered in Case 2 will be started from RAN#[99].*

- Note: This WID does not include measurement gaps that are configured for MUSIM purpose.

As for OPPO and CATT's question, our view is that Pre-MG+Pre-MG is included in case 1, and NCSG+NCSG is included in case 2.

5 – Huawei Technologies France

We can go with P1 from the moderator. However, it is better to clarify whether pre-MG + pre-MG is included in Case 1, and whether NCSG + NCSG is included in Case 1, based on the suggested wording in P1.

6 – MediaTek Inc.

According to the view collected so far, our suggestion to move forward is to take CMCC's updated Proposal 1 and also try to address the concern from OPPO, CATT and Huawei, i.e.,

Updated Proposal 1:

- Case 1: Pre-configured MGs and concurrent MGs (i.e., the network has provided UE with multiple measurement gap patterns where **at least** one gap pattern is a Pre-configured MG)

- Case 2: NCSG and concurrent MGs (i.e., the network has provided UE with multiple measurement gap patterns where **at least** one gap pattern is a NCSG)

Note: ~~Before RAN#[99], the requirement discussions focus on the scenarios that NCSG is not considered in Case 1 and that Pre-configured MG is not considered in Case 2~~ *The requirement discussions on the scenarios that NCSG is considered in Case 1 and that Pre-configured MG is considered in Case 2 will be started from RAN#[99].*

- Note: This WID does not include measurement gaps that are configured for MUSIM purpose.

To Qualcomm's comment, we think if we can't reach stable conclusions for Case 1 and Case 2, the discussions for more complicated scenarios will go nowhere. In that case, we may need to discuss the prioritization again (in RAN4 or in Plenary). Nevertheless, at this moment, we think this is a good middle ground to move forward.

7 – vivo Mobile Communication (S)

We notice that there is another Note in the WID already.

- Note: Prioritization among other possible combinations of pre-configured MG, concurrent MG and NCSG can be discussed in WI phase

With proposal 1 or updated proposals in this round of discussion, is the Note in the existing WID kept or to be removed as it is not mentioned in the new proposal?

In addition, it seems that combinations of multiple gap types are also possible based on the wording in proposal 1 or updated proposals, e.g. pre-MG + pre-MG + legacy gap, NCSG + NCSG + legacy gap, NCSG + concurrent gap (legacy gap + legacy gap) etc. The combinations can be various. If so, the scope of this WI may be a bit too flexible. We would like to hear more views on this aspect.

8 – Apple GmbH

We are fine with the updated proposal 1 from MTK, which could be a good compromise to move forward at current stage. Regarding vivo's comments w.r.t. three gaps, e.g. Pre-MG + pre-MG + legacy gap, NCSG + NCSG + legacy gap, NCSG + concurrent gap (legacy gap + legacy gap) etc. We don't think that's the intention of the updated proposal 1. The number of maximum gaps can be discussed in RAN4. Note that RAN4 had initial agreement that "For the max number of gaps for Case 1 and 2, the Rel-17 conclusions will be taken as the baseline."

9 – Beijing Xiaomi Mobile Software

In general, we can go with the updated proposal 1 from MTK. And we would like to make the following update by considering that the max number of gaps agreed in Rel-17.

Updated Proposal 1:

- Case 1: Pre-configured MG**(s)** and concurrent MG**(s)** (i.e., the network has provided UE with multiple measurement gap patterns where **at least** one gap pattern is a Pre-configured MG)

- Case 2: NCSG and concurrent MG**(s)** (i.e., the network has provided UE with multiple measurement gap patterns where **at least** one gap pattern is a NCSG)

Note: ~~Before RAN#[99], the requirement discussions focus on the scenarios that NCSG is not considered in Case 1 and that Pre-configured MG is not considered in Case 2~~ *The requirement discussions on the scenarios that NCSG is considered in Case 1 and that Pre-configured MG is considered in Case 2 will be started from RAN#[99].*

- Note: This WID does not include measurement gaps that are configured for MUSIM purpose.

10 – Beijing Xiaomi Mobile Software

In general, we can go with the updated proposal 1 from MTK. And we would like to make the following update by considering that the max number of gaps agreed in Rel-17.

Updated Proposal 1:

- Case 1: Pre-configured MG**(s)** and concurrent MG**(s)** (i.e., the network has provided UE with multiple measurement gap patterns where **at least** one gap pattern is a Pre-configured MG)

- Case 2: NCSG and concurrent MG**(s)** (i.e., the network has provided UE with multiple measurement gap patterns where **at least** one gap pattern is a NCSG)

Note: ~~Before RAN#[99], the requirement discussions focus on the scenarios that NCSG is not considered in Case 1 and that Pre-configured MG is not considered in Case 2~~ *The requirement discussions on the scenarios that NCSG is considered in Case 1 and that Pre-configured MG is considered in Case 2 will be started from RAN#[99].*

- Note: This WID does not include measurement gaps that are configured for MUSIM purpose.

11 – Nokia Corporation

We proposed to clarify that only one gap could be Pre-MG/NCSG to address the RAN4 discussion. Having 'at least' would mean that the UE could be configured with 2 Pre-MG patterns or a Pre-MG and an NCSG combinations. If this approach is fine with other companies we can compromise to have 'at least'.

However, this also depends on the discussion related to the Note.

4 Final Round

Summary of the final round discussion

- Gaps for NTN and MUSUM purposes
  - 11 companies provided comments. 8 companies are fine with Option A-1, and 7 companies are fine with Option A-2. (4 companies are fine with both options) In that case, Moderator suggests to go with a more conservative way, i.e., we adopt Option A-1 (preclude from Case 1 and Case 2), and leave this issue for later WG discussions
- ePOS gap
  - 9 companies provided comments. 8 companies agreed with Option B-2. 1 company prefers to leave it to RAN4 discussions. Due to a very obvious majority, Moderator suggest to go forward based on Option B-2.
- Definition of legacy gap
  - 12 companies provided comments. 11 companies agreed with Option C-1. 1 company prefer not to define new terminology. Moderator suggests further working on the text proposals to see whether we have the chance insert the definition in the WID to avoid RAN4 confusion.
- Order of requirement discussions for combinations of Pre-MG/NCSG + concurrent gap
  - It seems all companies are OK with the updated Proposal 1. Moderator will take Xiaomi's version as the baseline to move forward.
  - OPPO, CATT, Huawei had comments to clarify whether Pre-MG+Pre-MG and NCSG+NCSG are in Case 1 and Case 2, respectively. Moderator thinks they are in, as clarified by adding 'at least'
  - vivo mentioned the Note about later prioritization in the WID. Moderator think that note will still be kept unchanged. Therefore it was not mentioned in the proposals.

- vivo raised the questions about pre-MG + pre-MG + legacy gap, NCSG + NCSG + legacy gap, NCSG + concurrent gap (legacy gap + legacy gap) etc. As replied by Apple, RAN4 already has the related agreement on the same issue. Therefore, Moderator suggests not re-opening the discussion here.

4.1 Revised WID

With all above discussion, Moderator proposes the following revision to the Objective #1:

1. Enhancements of pre-configured MGs, multiple concurrent MGs and NCSG

    - Define RRM requirements for UEs configured with a combination of pre-configured MGs, and/or multiple concurrent MGs and/or NCSG [RAN4]

        - Prioritize at least joint requirements for UE configured with

            - Case 1: Pre-configured MG(s) and multiple concurrent MG(s) (i.e., the network has provided UE with multiple measurement gap patterns where at least one gap pattern is a Pre-configured MG)

            - Case 2: NCSG and multiple concurrent MG(s) (i.e., the network has provided UE with multiple measurement gap patterns where at least one gap pattern is a NCSG)

        - Note: Gaps that are configured for NTN and ePOS gaps are precluded in Case 1 and Case 2

        - Note: The requirement discussions on the scenarios that NCSG is considered in Case 1 and that Pre-configured MG is considered in Case 2 will be started after RAN#99.

        - Note: Prioritization among other possible combinations of pre-configured MG, concurrent MG and NCSG can be discussed in WI phase

        - Note: This WID does not include measurement gaps that are configured for MUSIM purpose

Moderator think further discussions on NWM may not be efficient enough for us to converge to the final wording of the revised objective. Therefore, companies are encouraged to directly provide comments to the revised WID (with track changes now) in the inbox:
https://www.3gpp.org/ftp/tsg_ran/TSG_RAN/TSGR_97e/Inbox/Drafts/%5B97e-25-R18-MeasGapEnh%5D