3GPP TSG-RAN WG2 Meeting #109e R2-200xxxx

eMeeting, 24th February - 06th March 2020

Agenda Item: 6.20.1.1

Source: MediaTek Inc.

**Title: Report of [AT109e][080][TEI16] NeedForGap capability (MTK)**

Document for: Discussion and decision

# 1 Introduction

This is report for the following e-mail discussion.

* [AT109e][080][TEI16] NeedForGap capability (MTK)

 Scope: Progress this based on agreements and papers above

 Intended outcome: issues resolution, solution agreements, work on CRs (for next meeting)

 Deadline: Mar 4

# 2 Discussion

## 2.1 Background

In RAN2#108, RAN2 discussed how to define the NeedForGap capability signaling in REL-16 and has the following agreement.

[R2-1914580](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CRAN2%5CDocs%5CR2-1914580.zip) Measurement gap capability information for Rel-16 UE Intel Corporation discussion Rel-16 TEI16

* For Release-16, if both the network and UE support such capability reporting, the measurement gap requirement information for NR target is reported back by the UE in the UE response to a NW configuration RRC message where this is reported based on the resultant configuration.
* Assumption: UE report *NeedForGap* capability for supported NR bands

Then in RAN2#109, the following agreement is made

[R2-2000716](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_109_e%5CDocs%5CR2-2000716.zip) Report of [108#58][TEI16] NeedForGap Signaling (MTK) MediaTek Inc. discussion

* The use of dynamic Need for gaps is configured by RRC.
* The UE includes the *NeedForGap* signalling In RRC Resume Complete, The UE always includes it.
* The UE includes the *NeedForGap* signalling In RRC Reconfiguration Complete, The UE includes the signalling if NeedForGap is changed.
* FFS if there are additional conditions (e.g. additional network control) and/or additional trigger (network request).

This offline discussion continues to discuss the open issues in NeedForGap.

## 2.2 Additional NW control on NeedForGap reporting

During the online discussion, some companies mentioned that it is desired for the NW to disable the NeedForGap reporting in RRC Reconfiguration Complete. The main reason is to avoid large RRC message size at cell edge. However, the rapporteur understand the current agreement already allow NW to do this. The dynamic reporting function is controlled by RRC, thus the NW could turn off the feature completely if it does not want UE to report it.

**Question 1: Do companies agree that the NW could deconfigure the “dynamic needForGap reporting” temporarily in order to prevent UE from sending the information?**

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| **Company** | **Yes/No** | **Comments** |
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**Summary:** TBD

**Proposal X:**

Based on current agreement, in RRC Reconfiguration Complete, the UE only reports the NeedForGap information if it is changed. During the online discussion, some companies also pointed out that the NW may want to request the capability no matter it is changed or not. Therefore, we would like to check with companies’ view on this. Whether a new indicator is needed to force the UE to report the NeedForGap information.

**Question 2: Do companies agree to introduce an additional “NeedForGap Request” flag in RRC Reconfiguration to force the UE to report the NeedForGap information in the corresponding Reconfiguration Complete message (No matter the capability is changed or not)?**

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| **Company** | **Yes/No** | **Comments** |
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**Summary:** TBD

**Proposal X:**

In [2], it is proposed to have a target band filter for the NeedForGap information. To reduce message size, the UE only reports the NeedForGap information for the target bands that is configured by the NW. As it is not discussed in original e-mail discussion, it would be good to collect other companies’ view on this.

**Question 3: Do companies agree to introduce a target band filter for NeedForGap information? If the target band filter is configured, the UE only reports the NeedForGap information for the corresponding bands.**

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**Summary:** TBD

**Proposal X:**

In [2], it is proposed to have a potential band filter in the dynamic need for gap configuration. The UE reports the NeedForGap information not only for current band combination, but also for the “potential” band combination provided in the list. The motivation is to allow NW to know the gap capability before inter-band handover or adding a new SCell.

**Question 4: Do companies agree to introduce a “potential band combination list” in the dynamic NeedForGap configuration? The UE reports the NeedForGap information not only for current band combination but also for the “potential” band combination provided in the list.**

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**Summary:** TBD

**Proposal X:**

## 2.3 Need for gap reporting content

The following is the proposed ASN.1 define for NR need for gap reporting content in the draft CR.

NeedForGapsInfoNR ::= SEQUENCE {

 intraFreq-needForGap ENUMERATED {gap, no-gap}

 interFreq-needForGapsFR CHOICE {

 needForGapsFR ENUMERATED {all, FR1-band, FR2-band, none},

 needForGapsBandlistNR NeedForGapsBandlistNR

 }

}

There are 2 aspects that are fully discussed and it would be better to get more companies’ comment on this.

The first one related to measurement gap requirement information on intra-frequency measurement. Unlike LTE, the NR intra-frequency may require measurement gap depending on BWP configuration. During the discussion, it is pointed out that some UE may be able to perform gapless measurement even if SSB is outside current active BWP. There is however no consensus on whether intra-frequency and inter-frequency measurement on the same band will have the same needForGap capability. So, it is proposed to have a separate capability bit for NR intra-frequency measurement.

**Question 5: Do companies agree to introduce a separate capability bit for NR intra-frequency measurement (e.g. intraFreq-needForGap)?**

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**Summary:** TBD

**Proposal X:**

The second one related to grouping of the target bands based on FR1 and FR2. To save the message size, it is proposed that the UE could report single measurement gap requirement information for all FR1 bands or all FR2 bands (if it requests gap for all bands in FR2). Please note that this may be related the mechanism in Question 3 (target band filter). It may need further clarification if both proposals are agreed.

**Question 6: Do companies agree that the UE could report measurement gap requirement information for FR1 bands and/or FR2 bands (i.e. with granularity of frequency range instead of per band)?**

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**Summary:** TBD

**Proposal X:**

## 2.4 Other comments

We have uploaded a draft 38.331 CR based on current agreement. The only changed is remove the condition to report NeedForGap in handover case. Except for the above open issues (Q1 to Q6), companies are invited to provide any other comment or suggestion on the 38.331 CR.

**Question 7: Any other comments or suggestion on current 38.331 CR?**

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**Summary:** TBD

**Proposal X:**

# 3 Conclusions

Base on the discussion in section 2, we have the following proposals:

# 4 References

[1] R2-2000716, “Report of [108#58][TEI16] NeedForGap Signaling (MTK)”, MediaTek

[2] R2-2001445, “Discussion on FFS issue in NR SA NeedForGap Signalling”, Nokia