**3GPP T****SG-RAN WG3 Meeting #110-e R3-211099**

**Online, 25th January – 5th February 2020**

Agenda Item: 9.3.8

Source: Ericsson

Title: Summary of Discussion for MeasGapConfig Transparent signaling

Document for: Discussion, Decision

# Introduction

A Summary of Offline Discussions has been assigned to the topic of Normal Release Cause Value.

The discussion has been summarised as follows in the meeting minutes:

**CB: # 94\_****MeasGapConfig\_signaling**

**- check usage (once again)**

**- need a common understanding w.r.t. handling of optional IEs! (e.g. what to do with sub-IEs)**

(E/// - moderator)

Summary of offline disc [R3-211099](file:///D:\\Users\\Zimmermann.Gerd\\Documents\\Int_Gremien\\3GPP\\RAN3\\2021\\RAN3%23111-E\\Inbox\\Drafts\\CB%20%23%2094_MeasGapConfig_signaling\\Inbox\\R3-211099.zip)

# For the Chairman’s Notes

* **It is proposed to add a description of the required inclusion of the *MeasGapConfig* IE for the procedure text concerning the CONTEXT SETUP RESPONSE and the UE CONTEXT MODIFICATION RESPONSE.**
* **It is proposed to agree to inclusion of the following description (tailored to UE Context Setup procedure, but adaptable to the gNB-CU initiated UE Context Modification procedure):**

If the *MeasGapConfig* IE is included in the *DU to CU RRC Information* IE contained in the UE CONTEXT SETUP RESPONSE message, the gNB-CU shall assume that the gNB-DU assigned a measurement gap and the gNB-CU shall perform RRC Reconfiguration or RRC connection resume, as specified in TS 38.331 [8], in order to transparently signal the *MeasGapConfig* IE to the UE.

* **Conclusion: Majority of companies agree that the inclusion conditions of optional IEs shall be present in the procedure description text. For some IEs such inclusion conditions description may be simple. A detailed inclusion conditions description is required for cases where misinterpretation of the IE’s presence conditions may cause interoperability issues.**
* **Agree to R3-21xxxx, revision of R3-210386 (remove text for gNB-DU triggered UE context Modification, remove “new” in the added text**
* **Agree to R3-21xxxx, revision of R3-210387 (remove text for gNB-DU triggered UE context Modification, remove “new” in the added text**

# Discussion

## Inclusion of procedure text for *MeasGapConfig* IE

At RAN3-110e the following was captured concerning how the *MeasGapConfig* IE is handled at the receiver side:

***Common understanding:***

***A new MeasGapConfig IE signaled from a gNB-DU to a gNB-CU should trigger a UE RRC reconfiguration aimed at configuring the measurement gaps***

***A new MeasGapConfig IE signaled from a gNB-DU to a gNB-CU should be signaled to the UE transparently***

*It is FFS whether the principles above need to be captured in RAN3 specifications?*

We note that the *MeasGapConfig* IE is an Optional IE within the *DU to CU RRC Information* IE. The *DU to CU RRC Information* IE is included in a number of messages over F1AP, amongst which the UE CONTEXT SETUP RESPONSE and the UE CONTEXT MODIFICATION RESPONSE.

The question left to answer at the last RAN3 meeting is whether the principles highlighted in the “Common Understanding” above, should be captured in the specifications.

To help us answering this question, Section 4.1 of TS38.473 contains relevant requirements reported below:

*Any required inclusion of an optional IE in a response message is explicitly indicated in the procedure text. If the procedure text does not explicitly indicate that an optional IE shall be included in a response message, the optional IE shall not be included.*

The text above applies perfectly to the *MeasGapConfig* IE in the CONTEXT SETUP RESPONSE and the UE CONTEXT MODIFICATION RESPONSE because the *MeasGapConfig* IE is optional and because those messages are response messages.

**Companies are invited to provide their views on whether a description of the required inclusion of the *MeasGapConfig* IE is needed for the procedure text concerning the CONTEXT SETUP RESPONSE and the UE CONTEXT MODIFICATION RESPONSE**

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| **Company** | **Comments** |
| Ericsson | In order to be compliant to section 4.1 of TS38.473, we need to include a description of the required inclusion of the *MeasGapConfig* IE in the procedure text. Not including it entitles a vendor to consider this IE absent, which would of course cause interoperability issues. Besides, not including such description leaves up to interpretation when the IE should be included and what the receiver behaviour should be when it is received. |
| Deutsche Telekom | We share the same view as Ericsson. |
| CATT | It is OK for CU initiated UE context modification procedure. |
| Nokia | We do not think this clarification is necessary and certainly not a critical correction. We also do not agree this will cause IOT issues.  As already discussed online, *DU To RRC Information* IE already includes *CellGroupConfig* IE as mandatory. *CellGroupConfig* IE already will trigger the RRC Reconfiguration. Thus, the proposed text is redundant as the outcome is the same regardless of this clarification.  Further, as also indicated earlier, *DU to CU RRC Information* IE has already many optional sub IEs without procedural text. An overall approach should be taken instead rather than single clarification for one sub-IE which as mentioned earlier, has no ambiguity in regards to its handling in our view. |
| ZTE | For UE Context Setup procedure, it already said in 8.3.1.2:  If the gNB-CU includes the SMTC information of the measured frequency(ies) in the *MeasurementTimingConfiguration* IE of the *CU to DU RRC Information* IE that is included in the UE CONTEXT SETUP REQUEST message, the gNB-DU shall generate the measurement gaps based on the received SMTC information. Then the gNB-DU shall send the measurement gaps information to the gNB-CU in the *MeasGapConfig* IE of the *DU to CU RRC Information* IE that is included in the UE CONTEXT SETUP RESPONSE message.  If the *MeasConfig* IE is included in the *CU to DU RRC Information* IE in the UE CONTEXT SETUP REQUEST message, the gNB-DU shall deduce that changes to the measurements configuration need to be applied. If the *measObjectToAddModList* IE is included in the *MeasConfig* IE, then the frequencies added in such IE are to be activated. Then the gNB-DU shall decide if measurement gaps are needed or not and, if needed, the gNB-DU shall send the measurement gaps information to the gNB-CU in the *MeasGapConfig* IE of the *DU to CU RRC Information* IE that is included in the UE CONTEXT SETUP RESPONSE message. If the *measObjectToRemoveList* IE is included in the *MeasConfig* IE, the gNB-DU shall ignore it.  And for UE Context Modification procedure, it already said in 8.3.4.2:  If the gNB-CU includes the SMTC information of the measured frequency(ies) in the *MeasurementTimingConfiguration* IE of the *CU to DU RRC Information* IE that is included in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall generate the measurement gaps based on the received SMTC information. Then the gNB-DU shall send the measurement gaps information to the gNB-CU in the *MeasGapConfig* IE of the *DU to CU RRC Information* IE that is included in the UE CONTEXT MODIFICATION RESPONSE message.  The current text already describes clearly when MeasGapConfig IE should be included in the response message. While for the subsequent handling, there has the scenario that CU may trigger another around of CU initiated UE Context Modification Request procedure in order to align the gap config among DUs when UE connects with multiple DUs under one CU with CA approach (the newly added DU may generate a different gap based on Measurement Timing Configuration received compared with the firstly added DU, then CU needs to make final decision), else the UE cannot perform the measurement properly due to misalignment gap configuration between the UE and network scheduling.  Therefore, we do not think “A new MeasGapConfig IE signaled from a gNB-DU to a gNB-CU should be signaled to the UE transparently” seems not correct for all cases. |

**Conclusion: The majority of companies see a need for the description of the required inclusion of the *MeasGapConfig* IE for the procedure text concerning the CONTEXT SETUP RESPONSE and the UE CONTEXT MODIFICATION RESPONSE.**

It should be noted that, in RAN3, the description of the required inclusion of an IE is expressed in terms of receiver’s behaviour.

With this respect, the common understanding minuted at the last RAN3 meeting provides the information necessary to describe the required inclusion of the *MeasGapConfig* IE. Namely:

***A new MeasGapConfig IE signaled from a gNB-DU to a gNB-CU should trigger a UE RRC reconfiguration aimed at configuring the measurement gaps*** [the highlighted text is the receiver’s behaviour at IE reception]

***A new MeasGapConfig IE signaled from a gNB-DU to a gNB-CU should be signaled to the UE transparently*** [the highlighted text is the receiver’s behaviour at IE reception]

If we try to translate the above in procedure text, a good approximation could be provided by the following text (which takes the UE Context Setup procedure as an example:

If the *MeasGapConfig* IE is included in the *DU to CU RRC Information* IE contained in the UE CONTEXT SETUP RESPONSE message, the gNB-CU shall assume that the gNB-DU assigned a new measurement gap and the gNB-CU shall perform RRC Reconfiguration or RRC connection resume, as specified in TS 38.331 [8], in order to transparently signal the *MeasGapConfig* IE to the UE.

**Companies are invited to express their view on whether the text above should be added to the procedure text for the CONTEXT SETUP RESPONSE and the UE CONTEXT MODIFICATION RESPONSE messages**

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| **Company** | **Comments** |
| Ericsson | We agree to add the text |
| Deutsche Telekom | We support the proposed text addition. |
| InterDigital | It appears that the text provides necessary information that can’t be inferred from context of the IE. |
| CATT | Maybe for the UE context setup procedure,it is not a “assigned a new measurement gap”just “assigned a measurementgap” |
| Nokia | No need to add as CU with existing description will trigger the RRC reconfiguration nevertheless due to *CellGroupConfig* IE anyway. |
| ZTE | Not needed. See comments in Q1. |

**Conbclusion: It is proposed to agree to inclusion of the following description (tailored to UE Context Setup procedure, but adaptable to the gNB-CU initiated UE Context Modification procedure):**

If the *MeasGapConfig* IE is included in the *DU to CU RRC Information* IE contained in the UE CONTEXT SETUP RESPONSE message, the gNB-CU shall assume that the gNB-DU assigned a measurement gap and the gNB-CU shall perform RRC Reconfiguration or RRC connection resume, as specified in TS 38.331 [8], in order to transparently signal the *MeasGapConfig* IE to the UE.

## Defining a general RAN3 position with respect to the description of required inclusion of optional IEs

Section 4.1 of TS38.473, which was quoted in section 3.1, is present in every stage 3 application protocol specification under the responsibility of RAN3.

The reason why this section is omni-present, is that it is essential for RAN3’s specifications to describe the conditions upon which inclusion of an optional IE is required. Failure to do so defeats the purpose of stage 3 specifications, leaving the specs up to different interpretations and therefore exposing to the risk of inter vendor interoperability problems.

**Observation 1: Failure to describe the conditions upon which inclusion of an optional IE is required, exposes the specifications to multiple interpretations and opens up to the risk of multi-vendor interoperability issues**

It is plausible that procedure descriptions for some optional IEs may be missing, e.g. due to tight deadlines (such as the closure of a release). However, the aim of RAN3 should be to complete the specifications with such descriptions as soon as possible. The reasoning according to which “there are so many optional IEs that we cannot specify the inclusion conditions for all of them” is not a valid argument. If there is the opportunity of clarifying the inclusion conditions of an optional IE, RAN3 shall take up the task and fulfill it.

**Observation 2: The reasoning according to which “there are so many optional IEs that we cannot specify the inclusion conditions for all of them” is not a valid argument. If there is the opportunity of clarifying the inclusion conditions of an optional IE, RAN3 shall take up the task and fulfill it.**

With the above said, **companies are invited to provide their views on whether RAN3 should commit to describe the inclusion condition of optional IEs in the procedure text, whenever there is an opportunity to do so.**

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| **Company** | **Comments** |
| Ericsson | We totally agree with the principle above. If we want the 3GPP standard to be considered as a state of the art, valid and complete standard, we should seriously take the task of describing the inclusion conditions of optional IEs in our specifications. If we do not fulfill this task, we produce an incomplete standard that can be interpreted in multiple ways and that exposes to the risk of interoperability issues. |
| Deutsche Telekom | The listed principle is a basic design criterium for implementation of multi-vendor networks allowing proper interoperability between equipment from different vendors which is more and more important from an operator’s perspective. Therefore, we see the need that RAN3 is following that principle in the specification work. |
| InterDigital | We also agree with the principle, in particular Observation 2 above. Ideally all optional parameters should have procedure text, but on occasion context of the parameters the text would be simple so it can have lower priority, but in cases like this one, when you have potential IOT issues it should be addressed. |
| CATT | In general,we agree with the principle.But I share the view of interdigital that maybe we could mainly focus on the parameters that may bring IOT issue first considering that the work to add description on every optional parameters is not negligible |
| Nokia | We believe procedural text is certainly needed for some IEs. However, mainly those encountered at top level. For the case of sub-IEs contained within another IE, this should be on a case by case basis. |
| ZTE | Fine with the principle to describe the inclusion condition of optional IEs in the procedure text, however, it should be under the ground that the discussion is sufficiently case by case. |

**Conclusion: Majority of companies agree that the inclusion conditions of optional IEs shall be present in the procedure description text. For some IEs such inclusion conditions description may be simple. A detailed inclusion conditions description is required for cases where misinterpretation of the IE’s presence conditions may cause interoperability issues.**

# Conclusion, Recommendations

# References

[1] R3-210624, Cause value on X2, Xn for normal release (Ericsson, Verizon Wireless, Deutsche Telekom, CMCC, BT, AT&T, China Unicom, Telecom Italia, Vodafone)