3GPP TSG-RAN WG2 Meeting #113 Electronic R2-210xxxx

Elbonia, 25 January – 05 February 2021

**Agenda item: 5.4.1.4**

**Source: Nokia**

**Title: Summary of [AT113-e][007][NR15] Inter Node RRC (Nokia)**

**WID/SID: NR\_newRAT-Core, TEI16**

**Document for: Discussion and Decision**

# 1 Introduction

This document is the report of the following email discussion:

5.4.1.4 Inter-Node RRC messages

**[AT113-e][007][NR15] Inter Node RRC (Nokia)**

 Scope: Treat [R2-2100586](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2100586.zip), [R2-2100772](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2100772.zip), [R2-2100773](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2100773.zip), [R2-2101934](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2101934.zip), [R2-2101347](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2101347.zip), [R2-2101705](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2101705.zip), [R2-2101935](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2101935.zip), [R2-2101936](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2101936.zip), [R2-2101944](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2101944.zip), [R2-2101021](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2101021.zip), [R2-2101022](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2101022.zip)

 Phase 1, determine agreeable parts, Phase 2, for agreeable parts Work on CRs.

 Intended outcome: Report and Agreed CRs.

 Deadline: A first round with Deadline for comments Thursday Jan 28 1200 UTC to settle scope what is agreeable

**SN initiated SCG release**

[R2-2100586](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2100586.zip) Clarification on inter node signalling upon SN initiated SCG release Samsung Telecommunications CR Rel-16 38.331 16.3.1 2340 - F NR\_newRAT-Core

**Band combination selection**

[R2-2100772](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2100772.zip) Clarification on band combination selection over inter-node message NTT DOCOMO INC. discussion Rel-15 NR\_newRAT-Core

[R2-2100773](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2100773.zip) Clarification on band combination selection over inter-node message NTT DOCOMO INC. CR Rel-15 38.331 15.12.0 2353 - F NR\_newRAT-Core

[R2-2101934](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2101934.zip) Clarification on band combination selection over inter-node RRC message NTT DOCOMO INC. CR Rel-16 38.331 16.3.1 2453 - A NR\_newRAT-Core

**Message size**

[R2-2101347](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2101347.zip) Discussion on inter-node coordination of message size in MR-DC Samsung Telecommunications discussion NR\_newRAT-Core

**MN and SN configuration restrictions**

[R2-2101705](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2101705.zip) Discusson on the usage of MN and SN configuration restrictions Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core

[R2-2101935](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2101935.zip) Clarification to usage of MN and SN configuration restrictions Nokia, Nokia Shanghai Bell CR Rel-15 38.331 15.12.0 2035 2 F NR\_newRAT-Core R2-2011224

[R2-2101936](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2101936.zip) Clarification to usage of MN and SN configuration restrictions Nokia, Nokia Shanghai Bell CR Rel-16 38.331 16.3.0 2036 2 A NR\_newRAT-Core R2-2011225

**ASN.1**

[R2-2101944](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2101944.zip) Lack of late non-critical extensions in inter-node messages Nokia, Nokia Shanghai Bell discussion Rel-15 NR\_newRAT-Core

**Intra-band EN-DC**

*Move from 6.1.1*

[R2-2101021](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2101021.zip) Companion paper for CR proposed for intra-band EN-DC deployment issue Nokia, Nokia Shanghai Bell discussion Rel-16 TEI16

[R2-2101022](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2101022.zip) Inter-node messaging for supporting intra-band EN-DC scenarios Nokia, Nokia Shanghai Bell CR Rel-16 38.331 16.3.1 2377 - B TEI16

# 2 **Discussion**

**Topic 1: SN initiated SCG release**

[R2-2100586](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2100586.zip) Clarification on inter node signalling upon SN initiated SCG release Samsung Telecommunications CR Rel-16 38.331 16.3.1 2340 - F NR\_newRAT-Core

There is ambiguity in current specification regarding inter-node signalling for the following case: SN

initiated release of SCG configuration while keeping some SN terminated DRBs. It seems that the MN

may not initiate SCG release towards UE while SN releases SCG, or MN may initiate SCG release

unintentionally depending on how one interprets the signalling. In EN-DC, the issue can be solved by

RAN3 via setting X2AP::SGNB MODIFICATION REQUIRED with SCG resources == not present, which

SN can inform MN to release SCG resource.However, in XnAP, no such IE can be found in XnAP::S-

NODE MODIFICATION REQUIRED.

**Question 1**: Do companies agree to the CR in [R2-2100586](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2100586.zip)?

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| --- |
| Answers to Question 1 |
| Company | Yes/No | Comments (e.g. changes required to be acceptable, why the CR is or is not needed) |
| ZTE | No with comments | We think it is a valid scenario, i.e. releasing the lower layer configuration of SCG. However, before discussing the detailed solution on how to inform MN, we think we should first discuss which node is responsible for making such decision? MN or SN?At least for SN addition procedure, it is up to MN to decide whether SN can only setup PDCP without any radio bearer (e.g. does not candidateCellInfoListSN in CG-ConfigInfo). However, in the scenario raised in the CR, maybe it is more appropriate to first send “request” (e.g. Inactivity indicator) to MN , and then let MN to decide whether to release SN’s lower layer, or release entire SN, or trigger bearer type change...etc.  So we suggest to let RAN3 to discuss this issue first, if RAN3 confirms the releasing of SCG lower layer can be initiated by SN directly, we can then discuss in RAN2 how to achieve this.  |
| Google |  | We understand this issue but we prefer to solve this issue in RAN3 as EN-DC. |
| Ericsson | No but the issue is valid | We acknowledge that the issue is valid and current signalling may bring to confusion when the SN wants to release the SCG lower layers. However, the option proposed in the CR is still not crystal clear and it assumes that the UE needs to check the presence/absence of two or more fields at once. This is not a future proof solution since the meaning or usage of those fields may change in next releases.For us, a clean and simple solution to address this issue would be to introduce an indicator in the INM so that the SN can inform the MN about the SCG release. |
| Huawei, HiSilicon | No | This can be done by X2 signalling in 9.2.108 EN-DC Resource Configuration in 36.423. |
| CATT |  | We prefer to discuss the issue in RAN3 first. |
| Samsung | Yes, but | We appreciate the clarification regarding X2AP i.e. that SN can indicate this by setting X2AP::SGNB MODIFICATION REQUIRED. However, we also need something for other cases and are open to consider alternatives e.g. some indication in RRC INM or Xn signalling by which SN can indicate it wants to release SCGWe understand that upon receiving such indication, MN initiates release of all SCG associated configuration i.e. including e.g. SN configured measurements, otherConfig |
| Nokia | RAN3 | The issue seems valid, while it's better with discussion first in RAN3 as they own X2/Xn interface specifications.In EN-DC, the issue can be solved by RAN3 via setting X2AP::SGNB MODIFICATION REQUIRED with SCG resources == not present, which SN can inform MN to release SCG resource. However, in XnAP, no such IE can be found in XnAP::S-NODE MODIFICATION REQUIRED. Thus it's better ask RAN3 to solve this issue in XnAP instead of RAN2 INM. |
| Intel | No | We also prefer to discuss the issue in RAN3 first to consider Xn-AP signalling first. |
| NEC |  | Agree with the issues.Firstly, we would like to know whether there is any problem to introduce an indication of SCG release w/o releasing UE context (or instead, w/ keeping UE context) in XnAP S-NODE MODIFICATION REQUIRED message?If it would not be feasible, we can consider the proposed CR or other way (e.g. Ericsson comment) to fix the issue. |
| vivo | No | We also prefer to discuss this issue in RAN3 first. |
| Apple | No | Agree with other companies that this issue is valid but we concern the impacts to UE. |
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**Summary 1**: Most companies think this must be discussed in RAN3 as to how SN can inform the MN of the SCG radio configuration release (there is a way that this is understood to work for EN-DC and companies think RAN3 could reuse the same principles towards Xn).

**Proposal 1**: The CR in [R2-2100586](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2100586.zip) is not pursued. Send LS to RAN3 (Samsung provides the draft) informing them about this scenario and ask them to design the necessary X2/Xn signalling.

**Topic 2: Band combination selection**

[R2-2100772](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2100772.zip) Clarification on band combination selection over inter-node message NTT DOCOMO INC. discussion Rel-15 NR\_newRAT-Core

[R2-2100773](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2100773.zip) Clarification on band combination selection over inter-node message NTT DOCOMO INC. CR Rel-15 38.331 15.12.0 2353 - F NR\_newRAT-Core

[R2-2101934](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2101934.zip) Clarification on band combination selection over inter-node RRC message NTT DOCOMO INC. CR Rel-16 38.331 16.3.1 2453 - A NR\_newRAT-Core

In current spec when MN sends SN with allowedBC-ListMRDC in CG-ConfigInfo there exists problem that since eNB has no reference to NR capability if MN narrow down a list of Allowed band combinations and transmits it to SN there is no band combination available for SN to select. For instance if MN received the following BC1 and BC2 from UE and narrow down the band combination list to BC1 only then send to SN. Suppose SN only support channel bandwidth of 100MHz operation then there is no band combination available for SN to select.

To resolve the problem mentioned above it is proposed that the MN may increase the probability that the SN finds a suitable SCG configuration by including in this field all entries that comprise at least the PCell band of MN.

**Question 2**: Do companies agree to the issue in [R2-2101934](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2101934.zip)? If yes, then please continue with the CR discussion as well if they are agreeable or not.

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| Answers to Question 2 |
| Company | Yes/No | Comments (e.g. changes required to be acceptable, why the CR is or is not needed) |
| ZTE | Acceptable | In our understanding, the intention of CR is correct. Although it is more related to network implementation, we can accept the clarification if it helps the discussion happened in other organization (e.g. O-RAN).Regarding the added sentence, we suggest to remove “of MN” for simplicity.The MN may increase the probability that the SN finds a suitable SCG configuration by including in this field all entries that comprise at least the PCell band ~~of MN~~. |
| Google |  | The issue can be resolved by the MN implementations. The current text does not prevent the proposal in the MN implementation. If companies think such clarification is needed, we suggest the wording is revised as as: “To make the SN easier find a suitable SCG configuration, the MN can include in the field the entries that comprise at least the PCell band”. |
| Ericsson | Yes | Same view as ZTE, we are also fine with the correction ZTE proposes and prefer to go with their suggested phrase. |
| Huawei, HiSilicon | No strong view | It’s acceptable if majority companies agree on this. |
| CATT | No | It seems the intention of the proposed change has already been covered by the following highlighted text.***allowedBC-ListMRDC***A list of indices referring to band combinations in MR-DC capabilities from which SN is allowed to select the SCG band combination. Each entry refers to:- a band combination numbered according to *supportedBandCombinationList* and *supportedBandCombinationList-UplinkTxSwitch* in the *UE-MRDC-Capability* (in case of (NG)EN-DC), or according to *supportedBandCombinationList* and *supportedBandCombinationListNEDC-Only* in the *UE-MRDC-Capability* (in case of NE-DC), or according to *supportedBandCombinationList* in the UE-NR-Capability (in case of NR-DC),- and the Feature Sets allowed for each band entry. All MR-DC band combinations indicated by this field comprise the MCG band combination, which is a superset of the MCG band(s) selected by MN.The MN may increase the probability that the SN finds a suitable SCG configuration by including in this field all entries that comprise at least the PCell band of MN. |
| NTTDOCOMO | Yes | This clarification is extremely important for operators. In particular for inter-vendor implementation case. Without this CR, EN-DC configuration may fail.Since eNB cannot decode the NR UE capability reported by UE, if eNB narrows down this allowedBC-ListMRDC too much, then gNB cannot select a suitable band combination for it, consequently SgNB addition request would be rejected and EN-DC configuration may fail.In RAN3, the following paper cosigned by a lot of operators present a similar issue. It says SgNB addition request will be rejected by SgNB due to insufficient UE capabilities i.e. MN narrows down this allowedBC-ListMRDC too much. They solve this issue from cause value perspective i.e. after the EN-DC configuration failure. Hence, this EN-DC failure problem due to insufficient UE capability do exist and is necessary to be solved by this CR.[R3-210409](file:///C%3A%5CUsers%5C5088196%5CAppData%5CLocal%5CTemp%5CTemp1_RAN3_111-e_agenda_with_Tdocs20210126_1952.zip%5CDocs%5CR3-210409.zip) Cause value on X2, Xn and F1 for insufficient UE capabilities (Ericsson, Verizon Wireless, Deutsche Telekom, CMCC, BT, AT&T, China Unicom, Telecom Italia, Vodafone)We are fine with ZTE’s suggested phrase. |
| Samsung |  | We see no real need to clarify (i.e. can be left to network implementation) and in general prefer not to populate our specifications with recommendations clarifying sensible network behaviour |
| Nokia | Weak no | We would assume it is implementation issue. MN can decide how to tell SN the allowed band combination list (e.g. “MN-greedy” or “SN-greedy”).We are open to see if there is really clear majority who wants to do something. |
| Intel | Acceptable | What CR is suggesting is different from the existing sentence “ All MR-DC band combinations indicated by this field comprise the MCG band combination, which is a superset of the MCG band(s) selected by MN.” given that it can be also MR-DC band combinations including at least the PCell bands i.e. not all MCG bands if MCG supports multiple frequency bands. Definitely, more band combinations information increase the probability but it comes with the cost that SCG configuration will require addition coordination if the SCG selects BC that doesn’t support bands that MCG configures as SCell. However, this coordination is already supported.  |
| NEC |  | We agree with the issue, but even though the issue could happen, we do not see a need of introducing further clarification in the specification, given that RAN2 had already assumed many of configurations which need MN-SN coordination could be left to OAM-based.However, if majority (or many companies) support, then it is acceptable. |
| vivo | Yes | We agree the intention of the CR, the clarification seems not add any impact to the current spec but to make the desirable implementation clearer. |
| Apple | No strong view. | We think this is a network implementation issue. |
| CMCC | Yes |  Agree with Docomo. We think such a clarification in field description is a nice guidance for implementation. |
| Telecom Italia | Yes | Agree with NTT DOCOMO that a clarification is needed to reduce EN-DC configuration failures. We are also fine with ZTE text.  |
| BT | Yes | The clarification proposed by Docomo is important to avoid potential inter-vendor problems.It’s fine for us to go with ZTE proposal. Apart from that, the probability increases if the MN includes all entries so, in order to be more accurate we propose to remove *may*.The MN ~~may~~ increase the probability that the SN finds a suitable SCG configuration by including in this field all entries that comprise at least the PCell band ~~of MN~~. |
| Verizon | Yes | Yes, a clarification is needed to avoid ambiguity and interoperability issues, especially in multi-vendor environment. As indicated by DocoMo we raised a similar issue in RAN3. ZTE suggested phrase looks fine. |

**Summary 2**:

* Most companies understand this is clearly about network implementation.
* 3 network vendors do not see any reason to capture MN/SN specific algorithmic aspects in the specification.
* 2 network vendors think this is acceptable but agree this doesn’t change anything in current understanding (i.e. the implementations can already do within the freedom of the current specs).
* 3 companies did not say YES/NO but left that choice blank. From their feedback it can be gleaned they don’t think the change is required.
* Given that 6 companies think technically the CR already clarifies current behavior, recommendation is that the CR is not pursued.

**Proposal 2**: Proposal is agreeable (details can be finalized further). One proposal is to clarify in chair notes (“When configuring *allowedBC-ListMRDC*, the MN may increase the probability that the SN finds a suitable SCG configuration by including in this field all entries that comprise at least the PCell band”).

**Topic 3: Message size**

[R2-2101347](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2101347.zip) Discussion on inter-node coordination of message size in MR-DC Samsung Telecommunications discussion NR\_newRAT-Core

RAN2 discussed DL RRC segmentation in case of Dual Connectivity and handover. In particular whether the SN (in case of Dual Connectivity) and the target (in case of handover) would need to be aware of the MN (in case of Dual Connectivity) and source (in case of handover) supports DL RRC segmentation.

The motivation for this is that the SN/target can provide RRC messages (SN-configuration and handover command respectively) to the MN/source which are beyond the PDCP limit only if the MN/source supports DL RRC segmentation.

RAN2 discussed whether the MN/source can indicate this to the SN/target in the SCG-ConfigInfo/AS-context. But based on the discussion it was identified that this is better to be discussed in and potentially addressed by RAN3.

The discussion in RAN2 was limited to segmentation. We however think that in DC there is an issue unrelated to support of DL segmentation. i.e. in case of DC the maximum size has to be shared between MN and SN. i.e. MN may initiate a reconfiguration that given UE capability limitations can only be done if SN performs a re-configuration at the same time. In such case there may be a need for MN to indicate what size is remaining for SN to use. Likewise, there may be cases in which SN initiates a re-negotiation i.e. requesting a larger share of the UE capabilities that may require MN to perform a reconfiguration at the same time. In both cases it is desirable for MN and SN to perform the reconfiguration simultaneously i.e. as it is desirable to have joint/ success failure.

**Proposal RAN2 is requested to discuss whether any R15 changes are required to coordinate sharing of the RRC message size between MN and SN or whether this can be addressed by RAN3 as part of the R16 discussions related to DL segmentation (as in the LS)**

**Question 3**: Do companies agree to the proposal in [R2-2101347](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2101347.zip)?

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| Answers to Question 3 |
| Company | Yes/No | Comments |
| ZTE | No | In our understanding, the message size goes beyond limitation mainly happens when both MN and SN are adding SCells at the same time. However, this may happen rarely. And from MN’s perspective, when MN receives the RRCReconfiguration message embedded in *CG-Config*, MN knows the size of this message. So MN can determine whether MN can also include other MCG configuration in MN *RRCReconfiguration* message or not. So we prefer to do nothing now. However, if most companies think this is urgent, we are open to further discuss it.  |
| Google |  | We prefer this is addressed by RAN3 as part of the R16 discussions. |
| Ericsson | No | We think this is not an issue and what is proposed is an optimization to integrate in the INM signalling the RRC segmentation feature that was standardized in Rel-16.Along this line, this does not look even a Rel-15 issue. Anyway, we are not so keen to have any change now. |
| Huawei, HiSilicon | No | No need to change Rel-15. Network can just upgrade to Rel-16 (as it is already being discussed in RAN3 R16). |
| CATT |  | Prefer to wait for RAN3’s discussion. |
| Samsung |  | The issue is not really related to segmentation, in fact it is more relevant when segmentation cannot be used. The issue relates to capability coordination, which primarily is RAN2 domain, hence we brought a paper here. It applies e.g. in case MN wants to take a large share of UE capabilities that requires SN to modify its configuration also. In such case, the reconfiguration should be included in one RRC message to have joint success/ failure.From the comments we understand that several companies think it is fine if SN always reserves a particular size for MN (although MN may rarely use it) and that when this is insufficient, MN will reject the procedure |
| Nokia | No | Our understanding is that, this can be addressed by RAN3 as part of the R16 discussions related to DL segmentation (as in the LS), to be a total solution for DL segmentation indication. |
| Intel | No | We don’t see a need for such coordination. MN has sufficient means to handle this if needed by splitting MN configuration into different messages. Rel-16 addresses this problem anyway. |
| NEC |  | It would be better to ask RAN3 to consider this as well as the previous DL segmentation issue, by sending another LS. |
| vivo |  | Agree that it would be better to ask RAN3 and wait for feedback. |
| Apple | No strong views | Can be left to RAN3. |
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**Summary 3**: There is quite strong resistance to agree to R2-2101347. Companies prefer to leave it up to RAN3 to discuss (also no need to send a LS – delegates are welcome to inform their counterparts in RAN3)

**Proposal 3**: Based on comments provided, we understand companies think no action is needed in RAN2 as it can either be left to RAN3 to consider or be left to network implementation (E.g. SN can handle the issue by reserving a particular size for MN, and up to implementation when and what size to reserve. If insufficient, MN may reject the procedure).

**Topic 4: MN and SN configuration restrictions**

[R2-2101705](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2101705.zip) Discusson on the usage of MN and SN configuration restrictions Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core

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| Observation1: configRestrictInfo is not allowed to be included in SgNB Modification Request procedure during an ongoing SN triggered Modification procedure.Proposal 1: If companies want to enhance the procedure to allow the MN to re-negotiate the configuration restriction in SN triggered modification procedure send an LS to RAN3 to ask whether SgNB Modification Refuse should be used to suggest the configuration restriction for the next round of SN triggered modification. |

[R2-2101935](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2101935.zip) Clarification to usage of MN and SN configuration restrictions Nokia, Nokia Shanghai Bell CR Rel-15 38.331 15.12.0 2035 2 F NR\_newRAT-Core R2-2011224

[R2-2101936](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2101936.zip) Clarification to usage of MN and SN configuration restrictions Nokia, Nokia Shanghai Bell CR Rel-16 38.331 16.3.0 2036 2 A NR\_newRAT-Core R2-2011225

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| The fields *CG-ConfigInfo::configRestrictInfo* and *CG-Config::configRestrictModReqSCG* have different roles in handling the MN/SN configuration restrictions: The MN field *configRestrictInfo* can be used in both MN and SN-initiated procedures, but the SN field *configRestrictModReqSCG* is only used in SN-initiated procedures. However, since this is not catured in the field descriptions there could be confusion as to how these fields are used: For example, if SN is allowed to include *configRestrictModReqSCG* in response to SN addition procedure, how should MN interpret this: Does SN accept the addition conditionally, or is it simply indicating a preference for other values? Either would break the Rel-15 MR-DC principle of not allowing "negotiation" during the procedures (i.e. only accept or reject is allowed), so this can cause inter-operability issues in case networks comprehend these differently. |

**Question 4A**: Do companies agree to Observation 1 and Proposal 1 in [R2-2101705](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2101705.zip)? Please comment.

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| Answers to Question 4A |
| Company | Yes/No | Comments |
| Huawei, HiSilicon (Proponent) | Yes | Observation 1 is to indicate that according to 36.423, if the MN triggers modification in an SN-initiated procedure, the motivation does not include re-negotiation on the configuration restriction. Therefore there’s no ambiguity, and the question is whether we need any enhancement.On Proposal 1, **we are ok with not having any optimization (i.e. MN does not include *configRestrictInfo* in SN-initiated procedures)**. If RAN2 wants to have any kind of enhancement, RAN3 spec and the stage 2 spec need to be modified as well. And from our perspective, enhancing the usage of SgNB Modification Refuse is a better way to go (as indicated in the latter part of Proposal 1). |
| ZTE | No  | First, we think the issue discussed in R2-2101705 is different from Nokia’s paper. Regarding the scenario raised in HW’s paper, in our understanding, if MN cannot accept the value requested by SN, MN can directly send SgNB Modification Refuse message without including a new value in it. From SN perspective, as long as SN receives SgNB Modification Refuse message, the SN knows the “request” is rejected by MN, and the SN has to use the previous value set by the MN. If the MN wants to allocate a new value to the SN, the MN can then initiate a new SgNB Modification Request procedure. So there is no need to include new value in SgNB Modification Refuse message. And no need to send LS to RAN3. [HW] We’re ok with not adding an optimisation, thus no LS is needed.Regarding observation 1, we think it is too strict to add such restriction. For instance, if MN accepts the value requested by SN, MN should be allowed to indicate the new value in *configRestrictInfo*, and send it to SN in response to SN initiated procedure. [HW] In our understanding, if MN accepts the value requested by SN, MN need not repeat the value in *configRestrictInfo*, that’s why we believe according to the current spec, MN shall not include *configRestrictInfo* in SN-initiated procedures. |
| Google |  | We agree with observation 1. Regarding proposal 1, we wonder such optimization is needed.[HW] We’re ok with only approving Observation 1 and not pursuing Prposal1. In this case, we would really want Nokia to keep their first change and revise the second change. |
| Ericsson | Yes | We basically agree with the proposal but we also want to echo Huawei comment regarding that the MN should not provide further restriction as response to an SN-initiate procedure. In such a case, the way how it work should be what is described by ZTE. We also think that no LS to RAN3 is needed.[HW] We’re ok with not sending an LS to ZTE. If Observation 1 can be agreed, we would really want Nokia to keep their first change and revise the second change. |
| CATT | Yes | We agree with observation 1. And as mentioned by other companies, we don’t need to introduce enhancement and proposal 1 is not needed. |
| Samsung | No | We think baseline operation is sufficient and it does not really require further clarification. It may be possible to introduce enhancements as suggested by P1, but we see no real need to optimise this in R15/ R16. I.e. MN can refuse and immediately initiate SN modification. |
| Intel | Partially | Agree with observation 1 but do not see a need for optimisation in proposal 1. We are OK to use Nokia CR and update as needed. |
| NEC | No | We have slight different understanding. Upon receiving the SN Modification Required, the MN can still think about how to adopt the request and what changes are necessary for the MCG and/or the SCG. The MN can still request another SCG restriction by taking into account the SN request. |
| vivo |  | Agree with observation 1, no need to send an LS. |
| Apple | Yes | We agree with the intention that re-negotiation is not supported. |
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**Summary 4A**: Based on the company inputs it seems preferred way forward is that MN does not include *configRestrictInfo* in SN-initiated procedures. There is a suggested alternative for that, but it will require a discussion in RAN3 as well. To save time, it is better not to pursue this track and optimize further. See also summary 4B and proposal 4B.

**Proposal 4A**: The CR in [R2-2101705](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2101705.zip) is not pursued.

**Question 4B**: Do companies consider that the CRs in [R2-2101935](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2101935.zip) and [R2-2101935](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2101935.zip) are agreeable? Please provide your comments on the CR

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| Answers to Question 4B |
| Company | Yes/No | Comments |
| Huawei, HiSilicon | No | First we would like to make sure whether the CRs want MN to carry *configRestrictInfo* in Step 2 or Step 6?If carried in Step 6, since the Uu signalling has been transferred to UE in Step5, it is possible that UE and SN will maintain different configuration (if SN accepts the restriction).If carried in Step 2, it is uncertain whether SN **must accept** this restriction. We believe MN should not force SN to accept the restriction, rather, it is a suggestion to SN. We think this suggestion process is an optimization because MN is already allowed to configure such restriction in MN-initiated procedures, so the preferred way is to stick to the current spec (MN does not include *configRestrictInfo* in SN-initiated procedures)[HW] We agree with the first change.***configRestrictModReq***Used by SN to request changes to SCG configuration restrictions previously set by MN to ensure UE capabilities are respected. E.g. can be used to request configuring an NR band combination whose use MN has previously forbidden. SN only includes this field in SN-initiated procedures.But the second change is not in line with the current spec (it is an enhancement which involves RAN3). We prefer to change this sentence to “MN only includes this field in MN-initiated procedures”.***configRestrictInfo***Includes fields for which SgNB is explictly indicated to observe a configuration restriction. This field may also be included in SN-initiated procedures. |
| ZTE | Yes to Rel-15 CR, Partially Yes to Rel-16 CR | We agree with the clarification sentences added in field description in both Rel-15 CR and Rel-16 CR.  But we don’t think the below new fields are needed in Rel-16 CR. For measurement configuration, it may change dynamically based on local RRM strategy and UE’s movement, the only thing we need to do is to ensure the measIDs configured by MN and SN won’t exceed UE’s capability. So from SN perspective, the SN only needs to know the maximum number it can configure to UE. There is no need to inform the MN the exact number of measIDs currently used by the SN in real time. CG-Config-v16xy-IEs ::= SEQUENCE { maxInterFreqMeasIdSCG-r16 INTEGER(1..maxMeasIdentitiesMN) OPTIONAL, maxIntraFreqMeasIdSCG-r16 INTEGER(1..maxMeasIdentitiesMN) OPTIONAL, nonCriticalExtension SEQUENCE {} OPTIONAL} |
| Google | Yes | We agree with the intent to capture the Rel-15 MR-DC principle of not allowing "negotiation" during the procedures.[HW] We have the same understanding that “negotiation” should not be allowed.But the second change in this CR is allowing MN to suggest a different value than what was suggested by SN in an SN-initiated procedure. That’s why we think the second change could complicate the current procedure.***configRestrictInfo***Includes fields for which SgNB is explictly indicated to observe a configuration restriction. This field may also be included in SN-initiated procedures. |
| Ericsson | Yes  |  |
| CATT | Yes to the first change | Share the same understanding that “negotiation” is not allowed. Hence, the first change is supported while the second change needs to be updated that *CG-ConfigInfo::configRestrictInfo* is only allowed to be used in MN initiated procedure. |
| Samsung | Partially | We are fine with fist change but don’t see the value of the 2nd changeWe think this can be left to network implementation. I.e. in general when MN accepts an SN initiated modification including re-negotiation, the MN response has to be consistent with request from SN. This should be sufficiently clear, so no need for any specific clarifications regarding these fields |
| Intel |  | Rel-16 CR does not look like a Cat A of the Rel-15 CR. Rel-15 CR – first change is OK, agree with HW to update the second change. Rel-16 CR: Agree with ZTE that signalling the current number is not needed.  |
| NEC | Yes to Rel-15, Partially Yes to Rel-16 | the proposed changes for Rel-15 and corresponding changes in Rel-16 CR are agreeable to us.On the other hand, other changes in Rel-16, as commented by ZTE, are not seen as necessary.  |
| Apple | Yes to first change, No to second change | If we agree that no re-negotiation is not supported, the second change is not right. |
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**Summary 4B**:

* Based on Proposal 4A, it seems rather natural to discontinue the 2nd change in Nokia’s contribution
* Then with ZTE’s comment about the tuning of measurement identities it would have been preferable that the open loop mechanism that MN provides the SN with a fixed rationed amount of identities could be adjusted by this mechanism, however it seems that this is not really seen as needed
* Companies are comfortable with the 1st change

**Proposal 4B**:

* 2nd change in [R2-2101935](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2101935.zip) and [R2-2101935](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2101935.zip) (i.e. explicitly mentioning use of *configRestrictInfo* in SN-initiated procedures) is not pursued
* Change concerning new *CG-Config-v16xy-IEs* in [R2-2101935](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2101935.zip) and [R2-2101935](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2101935.zip) is not pursued (i.e. the new fields are not added)
* Revise [R2-2101935](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2101935.zip) and [R2-2101935](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2101935.zip) with above feedback (including cover page cleanup etc.) for finalization

**Topic 5: ASN.1**

[R2-2101944](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2101944.zip) Lack of late non-critical extensions in inter-node messages Nokia, Nokia Shanghai Bell discussion Rel-15 NR\_newRAT-Core

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| Observation 1: None of the INMs have introduced OCTET STRING for late NCE corrections to Rel-15.Observation 2: The INM CG-Config CG-ConfigInfo and MeasurementTimingConfiguration have already been extended in Rel-16 making introduction of late NCEs to Rel-15 difficult.And proposed the following:Proposal 1: RAN2 to discuss how to handle late NCEs (for Rel-15 and Rel-16) to the inter-node messages |

**Question 5**: Do companies agree to observations and proposal made in R2-2101944?

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| Answers to Question 5 |
| Company | Yes/No | Comments |
| ZTE | No strong view | Agree to observations, no strong view to solution.  |
| Google |  | We can postpone discussing it until we encounter a real problem, that is, we need to add something to Rel-15. |
| Ericsson | No | We acknowledge that this was a mistake that we made in Rel-15 but our preference is to do nothing for now. We can introduce late NCEs in Rel-17 if we want to avoid to carry the same mistake.  |
| Huawei, HiSilicon | No strong view | Similar opinion as the above companies. |
| CATT | No strong view |  |
| Samsung | No strong view | We think it is good to conclude a way forward but think it is not a critical to resolve nowWe note that in LTE late NCEs seem present for some RRC INMs (HandoverPreparationInformation, SCG-Config) but not all relevant ones (i.e. not present for SCG-ConfigInfo). The containers enable receiver not comprehending the late NCE to skip it. I.e. they provide some additional flexibility. If not available, sender may need some awareness regarding what target can cope with. |
| Nokia | Yes | [Proponent] It would be great to have a common understanding of how we want to continue in future. There are good proposals above and we can consider something in the end. No strong push for really making a spec change right now but just drive for common understanding :-) |
| Intel | No | Network don’t have “releases” as such and hence it is not essential to have late critical extensions. We can use the normal non-critical extension mechanism. Networks can be upgraded to be able to comprehend the ASN.1 of a later release if a “late non-critical extension” of an earlier release is required.  |
| NEC | No strong view | firstly, agree with the observations and to discuss. Although there may be a possibility to have the late NCE for Rel-15 (nobody knows..), we would like to avoid NBC change for Rel-15. Fixing this from Rel-16, i.e. “Another choice” in this contribution seems preferable, if many other companies also support. we can go with majority. |
| vivo | No strong view |  |
| Apple | No strong view | Agree it’s an issue but if companies would like to not solve it right now, we are also fine. |
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**Summary 5**: All companies agree that (some inter-node messages in) Rel-15 cannot be “late NCE” extended. Two companies think this issue is not so critical as network can deal with comprehension of ASN.1 of a later release if required. One company thinks this is desirable to fix at least starting Rel-16. However, if this is done from Rel-16 onwards, this need not be done immediately as it only matter once Rel-17 RRC is created.

**Proposal 5a**: RAN2 agrees that inter-node messages will not be extended in Rel-15 anymore and any extensions will only be done from Rel-16 onwards.

**Proposal 5b:** RAN2 will introduce late NCE mechanism to Rel-16 INM when Rel-17 RRC specification is created.

**Topic 6: Intra-band EN-DC**

*Move from 6.1.1*

[R2-2101021](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2101021.zip) Companion paper for CR proposed for intra-band EN-DC deployment issue Nokia, Nokia Shanghai Bell discussion Rel-16 TEI16

[R2-2101022](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2101022.zip) Inter-node messaging for supporting intra-band EN-DC scenarios Nokia, Nokia Shanghai Bell CR Rel-16 38.331 16.3.1 2377 - B TEI16

Companies agreed unanimously last meeting in the email discussion on the proposals based on which the CRs are now implemented. See Annex B for the whole discussion and companies input.

**Question 6**: Is the intent of the CR in [R2-2101022](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2101022.zip) agreeable? The discussion paper in [R2-2101021](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2101021.zip) attempts to explain the changes in the CR.

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| Answers to Question 6 |
| Company | Yes/No | Comments (e.g. changes required to be acceptable, why the CR is or is not needed) |
| Huawei, HiSilicon | Yes but | We think the issue is valid, and the IEs to be exchanged should be: carrier center frequency, bandwidth, and band indication. |
| ZTE | Yes with comments |  Regarding whether to exchange “carrier center +BW” or reusing scs-SpecificCarrier, we actually think there is no big difference, anyway, one node (sending node or receiving node) needs to derive the “carrier center” information based on configured UE-specific channel BW. We slightly prefer to reuse *scs-SpecificCarrier* structure, so the calculation of carrier center is up to NW implementation, no need to capture it in specification. Regarding the issues raised in discussion paper, we think below Q2 is the most important that related to inter-operability, so we would like to confirm whether all companies have the same understanding. But the answer should have no impact to ASN.1 design. Q2 : Whether network needs to exchange the BWs of all configured SCSs?  This relates to RAN4's formula, as we known for a given serving cell, network can configure multiple BWs for different SCSs, then for RAN4's formula, which BW should be used (e.g. for BWNR\_channel) in calculating the required  Nominal Channel spacing. A2: In our understanding this is only the configured channel bandwidth and SCS which is active at a given time. Any change of this requires a new procedure towards the UE and should result in informing also the peer node.Regarding the CR, we would suggest to highlight in field description that the fields are referring to “UE-specific channel BW”, not “cell-specific channel BW”.  |
| Ericsson | Yes but | We agree with Huawei that carrier center frequency and bandwidth could be exchanged instead. For band indication, this may probably not be needed as the consequence of the UE capability coordination, i.e. MN sends allowedBC-ListMRDC and receives selectedBandCombination. |
| CATT | Yes | We have similar preference as ZTE to reuse the *scs-SpecificCarrier* structure, which means the calculation of carrier center is up to NW implementation. |
| Samsung | Yes, but | We are not sure if the proposal is to adopt option 3 i.e. that both nodes inform each other. We think option 3 seems the proper approachWe also wonder if the roles of nodes have been discussed regarding selection of contiguous/ non-contiguous i.e. which node decides. |
| Nokia | Yes | [Proponent] Glad to accommodate other companies’ views to finalize the CRs. |
| Apple | Yes | Fine with current CR. |
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Summary 6:

* All companies agree with the intent of the CRs in [R2-2101021](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2101021.zip) and [R2-2101022](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2101021.zip).
* 2 companies prefer to reuse the *scs-SpecificCarrier* structure while 2 companies prefer the carrier center frequency and bandwidth. There is common understanding that these are canonical ways of exchanging the intended information.
* 1 company thinks Option 3 is way to go but ask further which node decides regarding the selection. Rapporteur thinks the alignment is up to each node when its peer node informs the information. Overall UE capability cannot be exceeded.

**Proposal 6**: Continue the discussions and revise the CRs in [R2-2101021](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2101021.zip) and [R2-2101022](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_113-e/Docs/R2-2101021.zip) according to feedback from companies and agree to the revised versions.

# 4 Conclusion

Always echo the list of observations and proposals.

# Annex A – Contact Points

Respondents to the email discussion are kindly asked to fill in the following table.

|  |  |  |
| --- | --- | --- |
| Company | Name | Email Address |
| Nokia | Amaanat | amaanat.ali@nokia.com |
| Huawei, HiSilicon | Lili Zheng | zhenglili4@huawei.com |
| ZTE | LiuJing | liu.jing30@zte.com.cn |
| Google | Frank Wu | frankwu@google.com |
| Ericsson | Antonino Orsino | antonino.orsino@ericsson.com |
| CATT | Jing Liang | liangjing@catt.cn |
| Samsung | Himke van der Velde | Himke.vandervelde@samsung.com |
| NEC | Hisashi Futaki | hisashi.futaki[at] nec.com |
| vivo | Wen Ming | ming.wen@vivo.com |
| Apple | Yuqin Chen | yuqin\_chen@apple.com |
| Telecom Italia | Damiano Rapone | damiano.rapone@telecomitalia.it |
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# Annex B – Nokia contribution in RAN2#112-e was R2-2010976 Intra-band EN-DC deployment issue

**Proposal 1 : RAN2 to clarify in the description of the *scellFrequenciesSN-EUTRA* and *scellFrequenciesSN-NR* what the "frequency" means (i.e. carrier center frequency or the SSB frequency).**

Q2.1: Companies are invited to provide views on the above proposal.

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| **Company** | **Carrier centre frequency/****SSB frequency** | **Comments** |
| Qualcomm Incorporated | SSB frequency for NR / Center frequency for EUTRA | At least the combination of a serving frequency and *measuredFrequency* should be used by MN to identify the type of measurements configured by SN, i.e. either intra-frequency or inter-frequency. This is mentioned in section 7.2 of 37.340.There could be other intended purposes. |
| Ericsson (Tony) | SSB frequency for NR / Center frequency for EUTRA | Agree with QC understanding |
| ZTE(LiuJing) | SSB frequency for NR/ Center frequency for EUTRA | Agree with QC’s understanding. |
| Xiaomi (Yumin) | SSB frequency for NR / Center frequency for EUTRA |  |
| vivo(Wenming) | SSB frequency for NR / Center frequency for EUTRA | But it seems this paper was withdrawn.[R2-2010976](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_112-e/Docs/R2-2010976.zip)    Intra-band EN-DC deployment issue   Nokia, Nokia Shanghai Bell        discussion   NR\_newRAT-Core=> withdrawn |
| Samsung | SSB frequency for NR / Center frequency for EUTRA | As indicated by others, the field was introduced for coordination of measurements and from this perspective SSB frequency is appropriate |
| Huawei | SSB frequency for NR/ Center frequency for EUTRA | Agree with QC’s understanding. |
| Intel |  | Document is withdrawn as per chair’s notes and we should not discuss it officially. |
| NEC | SSB frequency for NR/ Center frequency for EUTRA  | We also agree with QC  |
| Apple | SSB frequency for NR / Center frequency for EUTRA |  |
| CATT(Jing) | SSB frequency for NR / Center frequency for EUTRA |  |
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**Proposal 2: RAN2 to discuss how to exchange PSCell/Scell(s) carrier center frequency and channel bandwidth to ensure UE capability is respected in intra-band EN-DC deployments.**

Q2.2: Companies are invited to provide views on the above proposal.

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| **Company** | **Comments** |
| Qualcomm Incorporated | The identified problem looks real.NR uses somewhat complicated way of expressing the exact location of channel bandwidth, like point A, SCS specifics and so on. Something similar to *FrequencyInfoDL/UL* may need to be added. |
| Ericsson (Lian) | The problem is valid, one could exchange point A and channel bandwidth to this end. |
| ZTE(LiuJing) | Seems this was discussed before, but no conclusion was made at that time (see below history).R2-1909971        Inter Node Message impacts due to intra-band EN-DC              Nokia, Nokia Shanghai Bell    discussion              Rel-15-       DOCOMO think this was discussed in February. Think these parameters such as channel raster and operating BW can be configured by operator O&M and do not need to be configured by INMs.-       Huawei have the same view as DOCOMO. ZTE think the OAM BW will be the cell channel BW but for intra-band EN-DC we need to refer to the UE channel BW to ensure it is contiguous across LTE and NR. So think the Nokia issue is valid. DOCOMO think referring to the band combination set index then the channel bandwidth is also understood. ZTE think it is the bandwidth and location that is important, not just the BW.=>    NotedStill, we think the issue is valid, and we are open to further discuss the solution. |
| Xiaomi (Yumin) | This is a valid issue. We can discuss further on how to exchange the frequency and bandwidth. |
| vivo(Wenming) | We are open to discuss the issue. But it seems this paper was withdrawn.[R2-2010976](file:///D%3A/Documents/3GPP/tsg_ran/WG2/TSGR2_112-e/Docs/R2-2010976.zip)    Intra-band EN-DC deployment issue          Nokia, Nokia Shanghai Bell   discussion        NR\_newRAT-Core=> withdrawn |
| Samsung | We agree there seems to be an issue, although(as indicated by ZTE and discussed earlier) the need depends on actual network deployment. Anyhow, we think existing signalling should not be affected but are open to consider introduction of extensions to address the issue. |
| Huawei | The issue is valid. RAN2 can consider adding carrier center frequency and channel bandwidth information into the inter-node message, maybe band information is also needed. (Having point A and BW may not be sufficient because point A itself does not help to deduce the center frequency.) |
| Intel | Document is withdrawn as per chair’s notes and we should not discuss it officially. |
| NEC | Our understanding is, similar to ZTE, that almost the same issue was discussed and concluded no specific action is taken, which would mean to assume OAM-based approach. Indeed, we are also open for further discussion (but from Rel-16)  |
| Apple | We also agree this is a valid issue. |
| CATT(Jing) | Agree with the issue. Channel bandwidth, SCS specifics and point A can be considered to exchange for intra-band EN-DC deployments. |
|  |  |