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:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2100586.zip), [R2-2100772](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2100772.zip), [R2-2100773](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2100773.zip), [R2-2101934](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2101934.zip), [R2-2101347](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2101347.zip), [R2-2101705](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2101705.zip), [R2-2101935](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2101935.zip), [R2-2101936](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2101936.zip), [R2-2101944](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2101944.zip), [R2-2101021](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2101021.zip), [R2-2101022](file:///D:\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:\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:\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:\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:\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:\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:\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:\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:\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:\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:\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:\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:\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:\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) |
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**Summary 1**: TBD.

**Proposal 1**: TBD.

**Topic 2: Band combination selection**

[R2-2100772](file:///D:\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:\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:\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:\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) |
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**Summary 2**: TBD.

**Proposal 2**: TBD.

**Topic 3: Message size**

[R2-2101347](file:///D:\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:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2101347.zip)?

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| Answers to Question 3 | | |
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**Summary 3**: TBD.

**Proposal 3**: TBD.

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

[R2-2101705](file:///D:\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:\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:\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:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2101705.zip)? Please comment.

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| Answers to Question 4A | | |
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**Summary 4A**: TBD.

**Proposal 4A**: TBD.

**Question 4B**: Do companies consider that the CRs in [R2-2101935](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2101935.zip) and [R2-2101935](file:///D:\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 | | |
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**Summary 4B**: TBD.

**Proposal 4B**: TBD.

**Topic 5: ASN.1**

[R2-2101944](file:///D:\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 | | |
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**Summary 5**: TBD.

**Proposal 5**: TBD.

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

*Move from 6.1.1*

[R2-2101021](file:///D:\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:\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:\Documents\3GPP\tsg_ran\WG2\TSGR2_113-e\Docs\R2-2101022.zip) agreeable? The discussion paper in [R2-2101021](file:///D:\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) |
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**Summary 6**: TBD.

**Proposal 6**: TBD.

# 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.

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| --- | --- | --- |
| Company | Name | Email Address |
| Nokia | Amaanat | amaanat.ali@nokia.com |
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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:\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.  =>    Noted  Still, 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:\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. |
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