3GPP TSG-RAN WG2 Meeting #117 Electronic R2-220xxxx

Online, 21 February – 03 March 2022

**Agenda item: 5.4.1**

**Source: Nokia (Rapporteur)**

**Title: Offline [AT117-e][029][NR15] RRC Inter-Node Signalling (Nokia)**

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

**Document for: Discussion and Decision**

# 1 Introduction

This document is the report of the following email discussion:

* [AT117-e][029][NR15] RRC Inter-Node Signalling (Nokia)

Scope: Treat R2-2202121, R2-2203500, R2-2203501, R2-2202806, R2-2202807, R2-2202808, R2-2202123, R2-2203321, R2-2203322. Ph1 Determine agreeable parts, Ph2 For agreeable parts, progress CRs, (reply LSes out only if needed).

Intended outcome: Report, Agreed CRs

Deadline: Schedule 1

Inter-MN HO without SN change

[1] R2-2202121 Reply LS on inter-MN handover without SN change (R3-216165; contact: Huawei) RAN3 LS in Rel-15 To:RAN2

Moved from 5.1

[2] R2-2203500 Clarification on inter-MN handover without SN change (R15) Huawei, HiSilicon, Nokia, Nokia Shanghai Bell, Ericsson, ZTE Corporation, Samsung CR Rel-15 37.340 15.15.0 0299 - F NR\_newRAT-Core

[3] R2-2203501 Clarification on inter-MN handover without SN change (R16) Huawei, HiSilicon, Nokia, Nokia Shanghai Bell, Ericsson, ZTE Corporation, Samsung CR Rel-16 37.340 16.8.0 0300 - A NR\_newRAT-Core

[4] R2-2202806 Signalling in inter-MN HO without SN change NEC discussion Rel-15 NR\_newRAT-Core

[5] R2-2202807 Clarification on inter-MN handover without SN change NEC CR Rel-15 38.331 15.16.0 2907 - F NR\_newRAT-Core

[6] R2-2202808 Clarification on inter-MN handover without SN change NEC CR Rel-16 38.331 16.7.0 2908 - A NR\_newRAT-Core

SN initiated release of SCG

[7] R2-2202123 Reply LS on signalling SN initiated release of SCG (R3-216236; contact: Ericsson) RAN3 LS in Rel-15 To:RAN2

Moved from 5.1

[8] R2-2203320 Clarification on SN initiated release of an SCG Ericsson, Nokia, Nokia Shanghai Bell CR Rel-15 38.331 15.16.0 2938 - F NR\_newRAT-Core

[9] R2-2203321 Clarification on SN initiated release of an SCG Ericsson, Nokia, Nokia Shanghai Bell CR Rel-16 38.331 16.7.0 2939 - A NR\_newRAT-Core

# 2 Contact Points

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

|  |  |  |
| --- | --- | --- |
| Company | Name | Email Address |
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# 3 Discussion

**Topic 1: Inter-MN HO without SN change**

In RAN2#113bis-e and #114e, the interpretation of the current specifications for inter-MN handover without SN change was deeply discussed, but there was no clear consensus. The LS to RAN3 was sent for asking the clarification on the presence of the SN UE X2/XnAP ID in the SN Addition Request from the target MN to the target (= source) SN. Now RAN2 has received the reply LS from RAN3 in [1] but unfortunately RAN3 did not address the key points which would have clearly helped RAN2 to conclude. Especially “No consensus on if the absence of SN UE X2/XnAP ID is applicable in case the source SN and target SN are the same SN” and “In case the SN UE X2/XnAP ID is provided alone, the SN is able to retrieve the stored UE context, there is no description in RAN3 specifications on whether the SN may perform delta configuration or not.” Seem to require RAN2 to make the final decision on the consequence of including or not including SN UE X2/XnAP ID and the influence of SN UE X2/XnAP ID on the full/delta configuration.

There is a TDOC in [4] with two proposals (the discussion will be on these to help companies understand the changes in [2], [3] which are Stage-2 focussed and [5], [6] which are Stage-3 focussed.

It is understood based on [4], that the proposal is to keep the SN UE X2/XnAP ID always PRESENT and switch the full/delta configuration behavior based on the presence or absence of the field set *{sourceConfigSCG/ scg-RB-Config}.* The rapporteur observes that [4] would like to keep the same “intention” of the current Stage-2 specification (labelled as Option 2 below)

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| * **Option 2: IE sourceConfigSCG and scg-RB-Config as full or delta configuration flag [3]** * Inter-MN HO without SN change (delta config is allowed in SN)   + SN UE X2AP ID present   + *sourceConfigSCG* present   + *scg-RB-Config* present * Inter-MN HO without SN change (SN must apply full config)   + SN UE X2AP ID present   + *sourceConfigSCG* not present   + *scg-RB-Config* not present |

However, the CRs in [2], [3] which are supported by all the network vendors seem to align to a different objective which is to allow both the network implementation options labelled as Case 1 and Case 2 below.

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| Case 1:   * Inter-MN HO without SN change (delta config is allowed in SN)   + SN UE X2AP ID            present   + *sourceConfigSCG*         not present   + *scg-RB-Config*               not present   Case 2:   * Inter-MN HO without SN change (delta config is allowed in SN)   + SN UE X2AP ID            not present   + *sourceConfigSCG*         present   + *scg-RB-Config*               present |

Rapporteur notes that Case 1 is the same as Option 2. Also, Case 2 is different from Case 1 as can be seen above.

**Proposal 1: RAN2 to confirm that current Stage 2 spec is aligned with the confirmation by RAN3. No change is necessary for Stage 2.**

**Proposal 2: RAN2 to confirm that the current specification intends the Option 2, where SN UE X2/Xn AP ID is “present” in SN Addition Request from target MN to target SN in inter-MN HO without SN change, regardless of delta config or full config for target SCG configuration.**

**Question 1: Do companies agree that both the network implementation possibilities (i.e., Case 1 and Case 2) need to be covered (which implies Stage-2 alignment)?**

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| Answers to Question 1 | | |
| Company | Yes/No | Technical Arguments |
| Nokia | Yes | We understand both the network implementation options need to be supported based on what’s already there out on the field. So, we think only supporting behavior based on only P1/P2 may not be appropriate. Hence we support moving ahead with the changes in [2], [3] |
| ZTE | Yes | Same view as Nokia. |
| Huawei, HiSilicon | Yes | Same view as Nokia. |
| Ericsson | Yes | Same view as Nokia |
| NEC | Yes with comment | We understand majority wants to support this (or understands this is already supported), then we are fine with this direction.  On the other hand, we have a concern on the cover sheet of [2][3]. It is the fact that the source SN and target SN are the same in Case 2. However, from procedure point of view, it is just like inter-MN HO “with” SN change, while it is the special case where source SN is same as target SN. As this is important to understand the real intention/meaning of inter-MN HO without SN change procedure, we would like to suggest changing the cover sheet by considering that aspect (e.g. to add text below in the last part of Reason for change), while are fine with the changes, as it seems majority is fine.  “ Note that in the Case 2, target SN is the same as source SN, while the handover procedure looks like a special case of inter-MN HO with SN change, where the source SN is selected as target SN. “  We would also like to ask a confirmation for our CRs [5][6] to be agreed with possible clarifications in the cover page by considering the changes by [2][3] ? |
| Qualcomm Incorporated | Yes |  |
| vivo | Yes | Both network implementations can work, so need to be supported. |
| Samsung | Yes | Same view as Nokia. |
| Docomo | See comment | Thanks network vendors to consolidating their view (or maybe the current state of what are in the field).  Our understanding is that, even if both Case 1 and Case 2 is covered (i.e. delta config is allowed in both cases), the MN can choose not to keep the UE context in the SN (i.e. not include SN UE XnAP ID) to force full configuration. If our understanding is correct, we agree with covering both cases. |
| Apple | Yes |  |
| Intel | Yes |  |
| CATT | Yes | Same view as Nokia. |
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**Summary 1**: TBD.

**Proposal 1**: TBD.

**Topic 2: SN initiated release of SCG**

In [7] RAN3 has agreed a batch of CRs as attached. The changes include:

* X2AP: reuse the existing IE named *EN-DC Resource Configuration* IE in the SGNB MODIFICATION REQUIRED message with clarification on the usage of the IE, to support the SN initiated SCG release request.
* XnAP, F1AP and W1AP: enhance the signalling with introduction of a new “SCG Indicator” IE to support the SN initiated SCG release request.

In particular, If the SCG Indicator IE is contained in the S-NODE MODIFICATION REQUIRED message and it is set to “released”, the M-NG-RAN node shall, if supported, deduce that an SCG is removed.

As an indirect impact to RAN2 specification due to the above behavior accepted in RAN3, when the SCG indicator is included, the SN should not include the scg-CellGroupConfig and scg-CellGroupConfigEUTRA fields in the inter-node RRC messages and this should be clarified in the current specification.

**Question 2**: Do companies support the intent of the CRs in R2-2203320 and R2-2203321 to align the field descriptions in scg-CellGroupConfig and scg-CellGroupConfigEUTRA in accordance with the RAN3 LS?

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| Answers to Question 2 | | |
| Company | Yes/No | Technical Arguments |
| Nokia | Yes | [Proponent] If the behavior is not aligned in RAN2 this may cause an unclear behavior at the target node since the target node does not know whether the SCG should be released or reconfigured. |
| ZTE | Yes | We think the changes are aligned with RAN3 LS, to avoid inter-operability issue, it is better to make it clear in our spec. |
| Huawei, HiSilicon | No | The changes are not needed, as they are covered by the existing wording.  *The field is absent if neither SCG (re)configuration nor SCG configuration query nor SN triggered SN change is performed, e.g. at inter-node capability/configuration coordination which does not result in SCG (re)configuration towards the UE. The field is also absent upon an SCG release triggered by the SN. This field is not applicable in NE-DC.*  The current text indicates that, the field is absent if neither A nor B nor C takes place. And the added scenario D (SN triggered SCG release) belongs to neither A nor B nor C, so naturally the field is absent for D. We don’t see a need to add an extra sentence as above. |
| Ericsson | Yes | [Proponent] Basically same view as Nokia. Also, good to align to the RAN3 LS and avoid any inter-operability issue in current specification. |
| NEC | Yes | We agree to clarify this in the spec. One very minor comment for “Consequence if not approved”. Probably, we can say “*If the CR is not approved, the target node* ***may*** *receive an SCG configuration during the SN-initiated SCG modification, even if the procedure is to release the SCG.* …” (i.e. change *will* to *may*) |
| Qualcomm Incorporated | Yes | RAN3 has confirmed this case (when no bearer is using SCG resource, SN should be allowed to request SCG release) therefore RAN2 alignment is required. |
| vivo | Yes |  |
| Samsung | Yes |  |
| Docomo | Yes |  |
| Apple | Yes |  |
| Intel | Yes | We think it is useful to clarify though as Huawei pointed out, it could probably be inferrred. |
| CATT | No | We agree with HW’s analysis. Currently we do not see strong need to change the spec.  It looks like companies have common understanding as to when these fields present and when not, so if needed as may perhaps make this clear by leaving something in the chair notes. |
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**Summary 2**: TBD.

**Proposal 2**: TBD.

# 4 Conclusion

**Topic 1: Inter-MN HO without SN change**

Summary 1: All companies support the understanding that both the network implementation options need to be supported based on what’s already there out on the field. Only supporting behavior based on only P1/P2 (i.e., Stage 3 alignment alone) may not be appropriate. Based on the unanimous consensus to move ahead, rapporteur proposes Stage-2 (and possibly Stage 3) CRs to be discussed in Phase 2.

**Proposal 1: Revise the Stage 2 CRs in R2-2203500 and R2-2203501 (discuss in Phase 2 if Stage 3 CRs addressing more general related to inter-MN HO without SN change is required by revising CRs in R2-2202807 and R2-2202808).**

**Topic 2: SN initiated release of SCG**

Summary 2: There is overwhelming consensus from 10 companies to pursue the changes as RAN3 incoming LS clarified a behavior that impacts RAN2 specification. Two companies oppose the change stating that the current specification text is already clear but it may be observed that the parts in RED only cover the normal cases when there is still a configured SCG but that doesn’t result in any configuration update towards the UE (and explicitly release is not scoped in this scenario). “*The field is absent if neither SCG (re)configuration nor SCG configuration query nor SN triggered SN change is performed, e.g. at inter-node capability/configuration coordination which does not result in SCG (re)configuration towards the UE.”*. Given that the current specification does not provide a clarity on the case RAN3 has now clarified, it is suggested to clarify this.

**Proposal 2: CRs in R2-2203320/ R2-2203321 are pursued (companies are allowed to provide comments in Phase 2).**

# 5 Annex-1

In RAN2#113bis-e and #114e, the interpretation of the current specifications for inter-MN handover without SN change was deeply discussed, but there was no clear consensus. The LS to RAN3 was sent for asking the clarification on the presence of the SN UE X2/XnAP ID in the SN Addition Request from the target MN to the target (= source) SN. Now RAN2 has received the reply LS from RAN3 indicating the following answers [1]:

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| **Question 1:**In the inter-MN handover without SN change scenario, is the SN UE X2/XnAP ID always required to be present when target MN sends SN Addition Request to SN?  RAN3 answer:   * If the target MN decides to keep the SN, the target MN sends SN Addition Request to the SN including the SN UE X2/XnAP ID as a reference to the UE context in the SN that was established by the source MN. * No consensus on if the absence of SN UE X2/XnAP ID is applicable in case the source SN and target SN are the same SN.   **Question 2:**For the same scenario, RAN2 would like to confirm with RAN3 if the receipt of SN UE X2/XnAP ID alone may be interpreted by SN to retrieve the SCG configuration to provide delta configuration?  RAN3 answer:   * In case the SN UE X2/XnAP ID is provided alone, the SN is able to retrieve the stored UE context, there is no description in RAN3 specifications on whether the SN may perform delta configuration or not. |