**3GPP T****SG-RAN WG3 Meeting #110-e R3-211125**

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

Agenda Item: 9.3.8

Source: Ericsson

Title: Summary of Discussion for NR-NR\_DCconfigRelease

Document for: Discussion, Decision

# Introduction

A Summary of Offline Discussions has been assigned to the topic of NR-NR DC configuration Release.

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

**CB: # 108\_****NR-NR\_DCconfigRelease**

**- check RAN2 progress (scenario seems valid)**

**- clarify SCG suspend/resume case, if needed**

**- clarify details**

**(E/// - moderator)**

**Summary of offline disc** [**R3-211125**](file:///C%3A%5CUsers%5Caarjona%5CDocuments%5C002%20-%20RAN3%20meetings%20docs%5C00%20-%202021%2001%20RAN3%20111-e%5CInbox%5CDrafts%5CCB%20%23%20108_NR-NR_DCconfigRelease%5CInbox%5CR3-211125.zip)

# For the Chairman’s Notes

**Proposal: it is proposed to agree to the need of indicating from MgNB-CU-CP to MgNB-DU that an SCG release occurred.**

**In light of the explanations provided in the SoD it is proposed to agree to R3-210407**

# Discussion

In [1] the cosourcing companies have described a case in which a UE is configured with dual connectivity.

For such configuration to take place, an MN needs to share the UE capabilities with an SN, so that both MN and SN can serve the UE, while never exceeding the overall UE’s capabilities.

As an example, we could focus on how MN and SN share band combinations.

Let’s assume that a UE can support two types of band combinations at the same time, e.g. BC#1 and BC#2. When an SCG want to be added for the UE, the MN gNB-DU will need to select only one of the BCs supported by the UE, so to leave “space” for the SN to also adopt one BC. We assume that the MN-gNB-DU selects BC#1 and signals it to the MN-gNB-CU by means of the *Selected BandCombinationIndex* IE over the F1 interface.

Such choice will be signalled to the SN by means of the allowedBC-ListMRDC (included in CG-ConfigInfo). In turn, the SN will select the remaining BC#2, which the UE can support (we assume that the SN also support this BC). At this point in time the SCG can be configured at the UE and the full UE capabilities are used in a shared way between MN and SN.

If however the SCG is released, the SN would stop using BC#2 at the UE. In an optimal solution the MN-gNB-DU should be informed of the SCG release, so that the MN can select a configuration for the UE that exploits the UE’s full capabilities.
However, there is today no means over the F1 interface to communicate to the MN-gNB-DU that an SCG has been released and that the full capabilities of the UE can be utilized.

During the online session it was mentioned that this topic may be handled by RAN2. Indeed, one mechanism to convey to the MN-gNB-DU the information that the SCG has been released is to include a flag in the RRC CG-Config IE. However, we note that the CG-Config is also used to convey inter node information from the SN to the MN.

In the SN to MN signalling (e.g. over the Xn) the IEs contained in the Xn messages are able to inform the MN that a DRB at SN has been removed and by that it is possible to determine that the SCG has been released. For example, the CG-Config IE contains the DRB-ToReleaseList for the SN. Hence, including a flag to indicate SCG release in the CG-Config IE would duplicate information over the Xn.
Also, resolving this issue at RRC level would mean to impact two specifications, 36.331 for EN-DC and 38.331 for MR-DC.

The only signalling where such SCG release indication is missing is from the MN-gNB-CU to the MN-gNB-DU, which is why we believe that adding an indication over the F1 signalling is the best option.

During the online discussions it was also asked whether a notification of SCG release should be also signalled when an SCG is suspended. We believe this may be investigated further and it is rather an optimization, hence not strictly needed as a Rel15/16 correction.

With the above in mind, **companies are invited to provide their view on whether a solution for indication of SCG release from MN-gNB-CU to MN-gNB-DU is needed.**

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| **Company** | **Comments** |
| Ericsson | Yes, a solution is needed. Not having a solution would imply that a UE will in most of the cases be served only by means of parts of its capabilities. This would lower performance substantially. |
| Nokia | No. It is already possible to inform changes at SN via the existing bearer type change IE for the changing MCG bearer to SCG/split bearer combinations.  |
| Huawei | Technically, MN-DU is not aware whether SN is released or not, and it is possible that configuration for MN-DU could be optimized.Since the configurations for dual connection take MN/SN/UE altogether into account, if SN is released, the configurations could be optimized taking just MN/UE into account.  |
| ZTE | Technically, if MN-DU has acknowledge of SCG statues (normal, release, suspend), it is useful for MN-DU to optimize its capability. However, I have a question, how the MN know the SCG not used (i.e., either release or suspend?). Does the SN shall notify the MN when non-SCG bearer and non-SRB3? |
| Samsung  | We think an indication is needed. This is a valid case where the SCG is released while the SN-terminated part (i.e., SDAP, PDCP) is still configured. In this case, MN-CU can be aware of the SCG release via Xn signaling. However, the MN-DU may not know via the existing signaling.  |
| CATT | We would like to check the meaning of SCG release hereDoes it means that the whole SN node is released or only is no SCG bearer for all DRBs while the SN node is still keps?If it is the first case, MN could know it. However, if it is the second case, currently,MN does not have this information.For example, for SN terminated bearer,MN does not know whether it is a SN terminated MCG bearer or SN terminated split bearer. |
| Ericsson | To clarify the scenario, the intention is to notify the gNB-DU that the SCG is released, i.e. that all bearers served by the SN over the air are released. The SN indicates such release to the MN by means of Xn signalling (via CG-Config), however, MN-CU-CP does not indicate this to MN-DU. It is not possible to indicate the release of an SCG by means of the bearer type change. The case we analyse is not one where the bearer is changed, but one where all bearers served over the air at SN are removed. |

**In light of the above, companies are invited to provide their view on the changes introduced in [2] and whether they can be agreed**

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| **Company** | **Comments** |
| Ericsson | We support to agree to the changes in [2]  |
| Nokia | We do not see this change as needed. |
| Huawei | However, we think this is just an optimization, since nothing breaks, and the band combination updates should not happen very frequently, so a R16 change should be enough. |
| ZTE | I support the intention. However, my question is that how the MN-CU can know that the SCG is not used then the MN-DU can occupy whole capability. |
| Samsung  | We support the changes for UE CONTEXT MODIFICATION REQUEST message. However, the changes for UE CONTEXT SETUP REQUEST message does need. We are wondering if there is a case of setting up context for MCG together with releasing SCG.  |
| CATT | As we described above, clarification on the SCG release is needed. |
| Ericsson | A clarification to the scenario was provided above. |

Conclusion: 5 companies support the change in [2], however this should be for Rel16 only. 1 company does not support the change stating that an SCG release can be known by means of bearer type change.

Proposal: it is proposed to agree to the need of indicating from MgNB-CU-CP to MgNB-DU that an SCG release occurred.

In light of the explanations provided in the SoD it is proposed to agree to R3-210407

# Conclusion, Recommendations

# References

[1] R3-210406, How to release NR-NR DC configurations between MN-CU and MN-DU (Ericsson, Verizon Wireless)

[2] R3-210407, How to release NR-NR DC configurations between MN-CU and MN-DU (Ericsson, Verizon Wireless)