3GPP TSG-RAN WG2 Meeting #117 Electronic DRAFTR2-2203638

Elbonia, 21st of Feb – 3rd of Mar 2022

**Agenda item: 8.2.3.2**

**Source: Nokia, Nokia Shanghai Bell**

**Title: Report from [AT117-e][224][DCCA] CPAC procedures from UE perspective (Nokia)**

**WID/SID: LTE\_NR\_DC\_enh2-Core - Rel-17**

**Document for: Discussion and Decision**

# 1 Introduction

The scope of this paper is as follows:

* [AT117-e][224][DCCA] CPAC procedures from UE perspective (Nokia)

 Scope: Attempt to resolve critical open issues for CPAC procedures from UE perspective based on contributions to 8.2.3.2

 Intended outcome: Discussion report in R2-2203638.

 Deadline: Deadline 3

The topics are discussed in detail within the next sections.

# 2 Discussion

This section is divided topic-wise, based on what has been contributed by the companies.

## 2.1 CPC with deactivated SCG

First topic to discuss in this thread concerns the coexistence of two main WI objectives, namely CPC and deactivated SCG. This has been listed within [1] and also addressed in several papers to RAN2#117, e.g. [3][5][7][9][12][13]. Various approaches have been provided:

* SCG activation state is included in conditionalReconfiguration [7]
* T-SN prepares candidate PSCells with suggested SCG state [5]
* No CPC triggering when SCG is deactivated[2][7][10]
* UE always considers SCG as activated when executing CPC [12]
* Do not support/address this coexistence [9][11][3]

The basic question should be whether this topic needs to be addressed in Rel-17 and what are the possible consequences if such coexistence is not resolved via specification.

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| **Question 1: Do you think the coexistence of CPAC and SCG deactivation needs to be addressed via specification? Please clarify in the Comments column what is the expected behavior.** |
| **Company** | **Answer** | **Comments** |
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## 2.2 Unsynchronized update of MCG configuration

Another topic which ultimately deserves to be resolved is how to handle the update of MCG configuration when it is also to be modified when CPC triggers. MN does not know the point in time when new MCG configuration will be applied by the UE, so there might be a configuration mismatch (i.e. MN expects the UE uses “old” configuration while the UE has already applied “new” MCG configuration). This has been addressed at least by the authors of [2][3][6][7][8][10][11].

Some companies claim this can be addressed via NW implementation, but that would actually require the MN to somehow wait for UE’s message using any configuration. It has been also proposed that the UE can respond to the MN using the old configuration and then apply the new one and complete CPC (via sending another message to the MN). This is a possible approach, but causing some delay in the overall procedure and in rapporteur’s opinion may lead to another issue when the UE (later) fails to comply with the new configuration, while the UE has already confirmed (earlier) the use of the new configuration.

Companies are asked to provide their views below.

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| **Question 2: How to resolve the “unsynchronized update of MCG configuration” issue? Choose from the list and provide the details:**1. **UE sends ULInformationTransferMRDC using old config and then subsequently the RRCReconfigurationComplete using new configuration**
2. **UE sends ULInformationTransferMRDC with embedded RRCReconfigurationComplete**
3. **Up to the NW how to handle it**
4. **Other**
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| **Company** | **Answer** | **Comments** |
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## 2.3 Target SN’s full or delta-configuration

For few meetings RAN2 is considering how to efficiently use delta-configuration for T-SN config when CPC is prepared. The topic has been mentioned at least in [2][3][9][12]. In rapporteur’s understanding, the acceptance of all suggested PSCells by T-SN is a relatively simple case, as the S-SN will not update its configuration, due to the preparation of the full set of suggested cells. Thus, delta configuration can be rather safely used by the T-SN without major risk of configuration mismatch. However, in a more likely scenario, not all cells will be acknowledged by T-SN and S-SN may still want to pursue reconfigurations after T-SN preparations. According to some papers, using full-config does not seem to be an efficient way and restricts NW’s flexibility too much. Please note that in rapporteur’s understanding, this may also be signalling-heavy, if all candidate cells (e.g. up to 8 CPC candidates) are prepared using full configuration. Thus, companies are asked to share their views on this topic.

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| **Question 3: How to ensure the T-SN can use delta-configuration for preparing PSCells even when not all suggested PSCells are acknowledged and eventually prepared?**  |
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## 2.4 Number of CPC configurations and coordination

RAN2 needs to also decide on the number of CPC configurations that can be supported in Rel-17 and their relationship with other CPC (e.g. intra-SN CPC, as defined in Rel-16) or CHO (if the decision to support CHO/CPC coexistence is taken) features. The topic was addressed at least by the authors of [2][3][11][12].

As has been observed in [3], as not all procedures will be initiated by the same node, there may be a need for inter-node coordination, especially if the UE is allowed to be configured with a relatively low total number of conditional configurations in parallel. In the simplest approach, there might be a static split of the number of CPC configurations each node can initiate. This would also have to consider the configuration ID handling. Please share any views you may have on this topic.

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| **Question 4: Considering various types of Conditional Reconfigurations for PSCell (CPA, intra-SN CPC, inter-SN CPC MN- or SN-initiated), what shall be the maximum supported number of CPAC configurations in Rel-17?**  |
| **Company** | **Answer** | **Comments** |
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Assuming your answer to Q4 is greater than 0, please also share your opinion how to ensure the coordination between the nodes.

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| **Question 5: How the coordination between MN and SN on CPAC configuration handling is done, so that the maximum number of configurations is not exceeded?**  |
| **Company** | **Answer** |
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# 3 Conclusion

The following proposals have been made in this document:

**Proposals for agreement:**

**Proposal y:**

**Proposals for discussion:**

**Proposal x**

# References

1. R2-2202029 Open issues for MR DC/CA further enhancements 3GPP TSG-RAN WG2#116bis-e Online, 17 - 25 January 2022
2. R2-2202305 Discussion on CPAC procedures from UE perspective vivo
3. R2-2202469 Open issues on Rel-17 CPAC procedures from UE perspective Nokia
4. R2-2202516 Text proposal to Uu siganling in CPAC Apple
5. R2-2202578 Discussion on CPAC with deactivated SCG Lenovo, Motorola Mobility
6. R2-2202777 Discussion on CPAC related open issues LG Electronics
7. R2-2202825 Remaining issues on CPAC from UE perspective ZTE Corporation, Sanechips
8. R2-2202924 Discussion on UE behaviour upon CPC execution MediaTek Inc
9. R2-2203101 Remaining issues on CPAC from UE perspective CATT
10. R2-2203171 Remaining issues for CPAC in UE perspective Samsung
11. R2-2203379 Remaining issues for CPAC Huawei, HiSilicon
12. R2-2203433 UE procedures and signalling for CPAC Ericsson
13. R2-2203476 CPC and SCG deactivation Sharp