**3GPP TSG-RAN WG2 Meeting #116is electronic R2-2xxxxxx**

**Online Meeting, Jan 17th – 25th 2022**

**Agenda item: 8.2.3.1**

**Source: CATT**

**Title: Report of [AT116bis-e][224][DCCA] CPAC procedures from NW perspective (CATT)**

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

**Document for: Discussion and Agreement**

1 Introduction

This document is for summary of the following discussions:

* [AT116bis-e][224][DCCA] CPAC procedures from NW perspective (CATT)

 Scope: Discuss the remaining details of CPAC procedures:
A) For SN initiated CPC: 1) Is the indication of prepared PSCells always sent to S-SN, and in which procedure step? 2) What are the RAN2/RAN3 messages use for indicating a) accepted cells from MN to S-SN, b) updated configuration from S-SN to MN and c) RRCComplete from MN to S-SN
B) For MN initiated CPAC: 1) Does MN provide separate list of proposed PSCells to T-SN? 2) Can T-SN pick different PSCells than those in the list?”

 Intended outcome: Discussion summary in R2-2201704.

 Deadline: Deadline 1

The document is structured as the following. Section 2 and 3 contain the discussions on some essential issues regarding SN-initiated CPC, and MN-initiated CPAC, respectively. Section 4 is for conclusions.

The participants are invited to leave their contact information in the following table.

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| --- | --- |
| Company | Contact: Name (E-mail) |
| J Huawei, HiSilicon | david.lecompte@huawei.com |
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2 SN-initiated CPC

2.1 Is the indication of prepared PSCells always sent to S-SN, and in which procedure step?

In the LS R2-2111323 [1], RAN2 has informed the following to RAN3

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| RAN2 has discussed SN initiated inter-SN CPC and has agreed on Solution 2, where the MN may inform the S-SN about the accepted/rejected candidate PSCell(s) and get a response from the S-SN including modifications of the UE configuration (e.g. measurement configuration) to be transmitted in the RRC Reconfiguration message including the CPC configurations to the UE. RAN2 assumes the MN decides, based on network implementation, whether to skip the second part of Solution 2 procedure. RAN2 has two understandings on the second part:a) MN not waiting for S-SN -> MN response or b) Both messages (i.e. MN-> S-SN and S->MN) being left out.RAN2 thinks MN can skip the second part of procedure in Solution 2 at least when T-SN acknowledges all candidate PSCells. |

In order to conclude on this issue we first need to confirm companies’ views on the two understandings above. Email Rapporteur’s understanding is that

* with a) it means the indication of prepared PSCells is always sent to S-SN by the MN, but MN may not wait for S-SN -> MN response, before sending the RRC Reconfiguration message including the CPC configurations to the UE, while
* with b) it may be that MN does not send the indication of prepared PSCells to S-SN at all (which is b.1 in Q2), or MN skip such indication in the second part of the Solution 2 procedure but should still send the indication in some later steps in the procedure (which is b.2 in Q2).

With the above understanding, companies are invited to answer the following question firstly.

**Question 1 Which understanding do you agree with, a) or b)?**

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| **Company** | **Understanding a) or b)** | **Comments if any** |
| Huawei, HiSilicon | b) (but if RAN3 prefers to add something, it is up to them) | We understand that:1) the MN will always do the second part if one or more candidate target PSCells are not prepared by the source T-SN.2) the MN will always send a message to the S-SN in order to confirm that the MN reconfigures the UE according to the initial S-SN request.If the S-SN receives 2) directly, it implies that all candidate PSCells were prepared by the T-SN, even if there is no explicit indication for that.Of course, RAN3 is free to add whatever explicit indication to RAN3 signalling, even though it is not necessary from RAN2 perspective. |
| Nokia | b) |   |
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Then if you agree with understanding b), please further answer the following question.

**Question 2 If you agree with understanding b), which option do you prefer,**

* **Option b.1 MN may not send the indication of prepared PSCells to S-SN, i.e.,**
* **Option b.2 MN should always send the indication of prepared PSCells to S-SN (i.e., if MN skips the indication to S-SN before sending the RRC Reconfiguration message including the CPC configurations to the UE, it should send the indication to S-SN in some later step in the procedure)**

**And if you agree with Option b.2 please clarify in this case in which step MN sends the indication to the S-SN.**

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| **Company** | **Which option** | **Comments if any** |
| Huawei, HiSilicon | b.1 or b.2 | b.1 but if RAN3 wants to have some indication in some message, it is up to RAN3. |
| Nokia | b.2 | In case MN decides to send CPAC configuration immediately to the UE, then MN informs the source SN about the list of PSCells that are prepared using SN Change Confirm message. |
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**Summary:**

**TBD**

2.2 What are the RAN2/RAN3 messages used for the procedure

Generally, Email rapporteur’s understanding has been that the message interaction between MN, S-SN and T-SN used for the procedure of SN initiated inter-SN CPC is within the scope of the RAN3, and RAN3 is discussing on these messages currently. But there are some company contributions on the topic. More details can be found in the following.

### 2.2.1 Messages used for indicating the accepted cells from MN to S-SN

Based on the contribution of [10], SN change confirm message is used to provide the indication of accepted candidate PSCells to S-SN. Another option is to leave this to RAN3.

The following question is for the case if MN sends the indication to S-SN before sending the RRC Reconfiguration message including the CPC configurations to the UE.

**Question 3: Which option do you prefer regarding the message used for indicating the accepted PSCells from MN to S-SN, before sending the RRC Reconfiguration message including the CPC configurations to the UE?**

* **Option 1: leave it to RAN3;**
* **Option 2: SN change confirm message is used to provide the accepted candidate PSCells to S-SN[10]**

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| **Company** | **Which option** | **Comments if any** |
| Huawei, HiSilicon | option 1 | RAN3 should choose what fits with RAN3 procedures. |
| Nokia | Option 1 | We are OK to leave it up to RAN3 to decide. We have a corresponding paper submitted to RAN3 (R3-220150), where we suggest to use optionally MN-initiated Modification procedure to contact S-SN . Then, SN Change Confirm is sent after receiving the complete message from the UE. |
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**Summary:**

**TBD**

The following question is for the case if MN sends the indication to S-SN after sending the RRC Reconfiguration message including the CPC configurations to the UE (i.e., as in option b.2 in section 2.1).

**Question 4: Which option do you prefer regarding the message used for indicating the accepted PSCells from MN to S-SN, after sending the RRC Reconfiguration message including the CPC configurations to the UE (if option b.2 is supported)?**

* **Option 1: leave it to RAN3;**
* **Option 2: SN change confirm message is used to provide the accepted candidate PSCells to S-SN**

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| **Company** | **Which option** | **Comments if any** |
| Huawei, HiSilicon | Option 1 |  |
| Nokia | Option 1 | But we think SN Change Confirm for this scenario is a good choice (which shall be made in RAN3). |
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**Summary:**

**TBD**

### 2.2.2 Message used for S-SN to provide the updated configuration

Similarly there are possible options and views are invited on the message used for S-SN to provide the updated configuration.

**Question 5: Which option do you prefer regarding the message used for S-SN to provide the updated configuration? Please specify the reasons or comments if any.**

* **Option 1: leave it to RAN3**
* **Option 2: SN initiated modification procedure is used for S-SN to provide the updated configuration [10];**

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| **Company** | **Which option** | **Comments if any** |
| Huawei, HiSilicon | Option 1 |  |
| Nokia | Option 1 | But we think it should be MN initiated modification procedure (the response to request message sent by the MN). |
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### 2.2.3 Message used for providing the RRCReconfigurationComplete message from MN to S-SN

Based on the stage 2 running CR [2], it is FFS how to provide the RRCReconfigurationComplete message to S-SN in step 8a, i.e., after the UE has sent the RRCReconfigurationComplete message to indicate the embedded RRCReconfiguration message of S-SN has been applied;

In legacy, the SN Reconfiguration Complete message is used by MN to provide the embedded RRCReconfigurationComplete message to S-SN. Thus, one option is to use the same message in CPAC. There are also other options as listed below.

**Question 6: Which option do you prefer regarding the message used for providing the RRCReconfigurationComplete message from MN to S-SN?**

* **Option 1: leave it to RAN3**
* **Option 2: legacy SN Reconfiguration Complete message can be reused to provide the embedded RRCReconfigurationComplete message to S-SN;**
* **Option 3: to use the SN Change Confirm message to indicate the RRCReconfigurationComplete message in case understanding 2 of Question 1 is taken, and the MN decide to skip the second part of the Solution 2 procedure [10]**

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| **Company** | **Which option** | **Comments if any** |
| Huawei, HiSilicon | Option 1 |  |
| Nokia | Option 1 (and Option 3) | RAN3 shall decide it is Option 3. |
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**Summary:**

**TBD**

3 MN-initiated CPAC

The following open issues on MN initiated CPAC should be addressed:

1) Does MN provide separate list of proposed PSCells to T-SN, and

2) Can T-SN pick different PSCells than those in the list?”

## 3.1 Does MN provide separate list of proposed PSCells to T-SN

On the issue of how to provide the candidate cells recommended by MN to T-SN, the following are proposed by [8] [10] [11] [13]:

* Option 1: Use legacy candidate cell information (candidateCellInfoListMN) to provide the candidate cells recommended by MN to T-SN [8] [10];
* Option 2: Introduce a new list to include the candidate cells recommended by MN for MN initiated CPAC [11];
* Option 3: Reuse the list of proposed PSCell candidates within CG-ConfigInfo introduced for SN initiated inter-SN CPC to provide the candidate cells recommended by MN to T-SN [13];

**Question 7: Which option (i.e., Option 1/2/3) above do you prefer?**

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| **Company** | **Which option** | **Comments if any** |
| Huawei, HiSilicon | Option 3 | We prefer to align with SN-initiated CPC, so that T-SN behaviour is the same. |
| Nokia | Option 1 or 3 | We think either the existing IE shall be used (Option 1) or it should be considered if the same IE as defined for SN-initiated CPC can be adopted (Option 3). |
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**Summary:**

**TBD**

## 3.2 Can T-SN pick different PSCells than those in the list

On the issue of whether T-SN can pick target cells not proposed by the MN, the following are based on [8] [10][13]:

* Option 1: Only the cells within the list recommended by MN can be chosen by T-SN [8] [13];
* Option 2: Cells not belonging to the list recommended by MN can be chosen by T-SN [10];

**Question 8: Which option (i.e., Option 1/2) above do you prefer?**

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| **Company** | **Which option** | **Comments if any** |
| Huawei, HiSilicon | Option 1 | We prefer to align with SN-initiated CPC, in order to make specification maintenance easier. |
| Nokia | Option 2 | The same as we have argued for SN-initiated CPC: we see no reason why the ultimate list shall be prepared by the source/initiating node (S-SN or MN in this case). Ultimately it should be T-SN’s right to choose appropriate cells (if measurement results are provided) for CPAC.  |
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**Summary:**

**TBD**

4 Conclusion

TBD

5 References

1. R2-2111323 LS on SN initiated inter-SN CPC
2. R2-2201646 Introduction of CPA and inter-SN CPC CATT draftCR Rel-17 37.340 16.8.0 B LTE\_NR\_DC\_enh2-Core R2-2111640
3. R2-2200361 Discussion on the CG-CandidateList Google Inc. discussion LTE\_NR\_DC\_enh2-Core
4. R2-2200362 Support modification and cancellation of C-PSCells in the CG-CandidateList Google Inc. draftCR Rel-17 38.331 16.7.0 B LTE\_NR\_DC\_enh2-Core
5. R2-2200589 Discussion on CPAC procedures from NW perspective vivo discussion Rel-17 LTE\_NR\_DC\_enh2-Core
6. R2-2200613 Skip response from S-SN in SN-initiated CPC NEC discussion Rel-17 LTE\_NR\_DC\_enh2-Core
7. R2-2200773 Discussion on CPAC from NW perspective Lenovo, Motorola Mobility discussion Rel-17
8. R2-2200923 Remaining issues on CPAC procedure ZTE Corporation, Sanechips discussion Rel-17 LTE\_NR\_DC\_enh2-Core
9. R2-2200924 Further consideration on CPAC procedure ZTE Corporation, Sanechips discussion Rel-17 LTE\_NR\_DC\_enh2-Core
10. R2-2201000 CPAC network procedures Ericsson discussion Rel-17 LTE\_NR\_DC\_enh2-Core
11. R2-2201072 CPAC procedures from network perspective Qualcomm Incorporated discussion Rel-17
12. R2-2201081 Solving open issues for Rel-17 CPAC Nokia, Nokia Shanghai Bell discussion Rel-17 LTE\_NR\_DC\_enh2-Core
13. R2-2201250 Discussion on CPAC from NW perspective CATT discussion Rel-17 LTE\_NR\_DC\_enh2-Core
14. R2-2201305 CPAC procedure for SCG update Samsung R&D Institute UK discussion