3GPP TSG-RAN WG3 Meeting #110-e R3-206884

E-meeting, 2 – 12 November, 2020

**Agenda item: 10.2.2**

**Source: Huawei (moderator)**

**Title: CB: # 1008\_SONMDT\_CCO - Summary of email discussion**

**Document for: Approval**

# 1 Introduction

This paper provides summary of discussions at RAN#110-e on:

**CB: # 1008\_SONMDT\_CCO**

**- Topics to discuss:**

 **- Beam related information**

 **- Cell shaping and beam shaping**

 **- gNB-DU is responsible to modify the coverage of an NR cell?**

 **- gNB-CU-CP is responsible for CCO issue detection?**

 **- Transfer of coverage measurements collected at the cell border**

 **- NR coverage modification triggered by LTE for improved EN-DC connectivity**

 **- Xn and F1 signaling details**

 **- May also discuss other topics based on contributions**

**- Propose to have the discussion in two phases; if there are agreements in the first phase, can proceed to discuss TPs in the second phase**

(HW - moderator)

Summary of offline disc [R3-206884](file:///D%3A%5C3gpp%E4%BC%9A%E8%AE%AE%5CRAN3%5CRAN3%23110%5Cdraft%5CCB%20%23%201008_SONMDT_CCO%5CInbox%5CR3-206884.zip)

Initial comments is received by Thursday, Nov. 5, 8:00 UTC. This will be presented as an intermediate summary, and will be submitted to the inbox for the online discussion starting at Thursday, Nov. 5, 13:00 UTC

# 2 For the Chairman’s Notes

[To be completed]

# 3 Discussion

## 3.1 Xn functionality and related signalling

Applicable agreements and open issues listed below

**Agreements:**

E-UTRAN CCO function should be considered as baseline for NG-RAN CCO solution for dynamic coverage changes with an index-based solution for coverage switching among deployment options

In NG-RAN scenario, a NG-RAN node may send to a neighbor NG-RAN node a coverage modification list which includes deployment related information concerning the serving cells. Whether to include SSB beam information for NR cell (on top of cell info) is FFS.

Exchange at least NG-RAN CGI, Cell Coverage State, Cell Deployment Status Indicator, Cell Replacing Info in NG-RAN NODE CONFIGURATION UPDATE message over Xn for coverage modification

***Open issues:***

*FFS (on impact/usefulness) whether to support SSB beam coverage optimizations in NR CCO for beam coverage switching, SSB beam shaping/splitting/merging scenarios*

### 3.1.1 General

The agreement so far is to include E-UTRAN CCO function should be considered as baseline. This baseline functionality entails informing neighbour nodes about coverage changes to improve the MRO performance. This is expressed as signalling different states so that MRO can retrieve a previously stored states (e.g. including statistics).

Another possibility would be to use this information for other purposes, e.g. to trigger matching coverage modifications in the receiving node as discussed in R3-206514.

**Question: Is this baseline functionality enough over Xn? Any other functionality to be discussed?**

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| --- | --- |
| Company | Comment |
| Huawei | This baseline functionality is enough. If we exchange coverage to have matching coverage actions in another node we have to express this in a way that conveys the coverage impact at the receiving side or use some form of cross node coordination of OAM. This is not described in the proposed solution. This was discussed for LTE but not pursued. |
| CATT | Prefer to support basic function for CCO which is similar with LTE and then discuss other aspects later |
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**Summary**

* To be added before online session

### 3.1.2 Beam information

With NR, the concept of beams are introduced.

**Question: Do we need to include signalling of beam information over Xn to cover the basic functionality described in 3.1.1?**

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| Company | Comment |
| Huawei | Different beam configurations can be expressed as different cell states. It is very important to keep the number of states in a controllable low level since it directly relates to different MRO states. It is however important to discuss the range of states. In LTE it is 16 per cell. We may want to extend to e.g. 32, but the number should be kept low.The reason is that it is impossible for the receiving node to know how to group these states. The receiver cannot know how large modification is done for each state. Hence, the receiver cannot make any assumptions like, state X is similar to state X+1 and the statistics can therefore be re-used for both. |
| CATT | Not quite sure.We have sympathy with Huawei that we should consider the complexity of introducing beam level configuration. Different cell state could already represent different beam configurations. |
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**Question: Do we need to include signalling of beam information over Xn to cover any new functionality described in 3.1.1**

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**Summary**

* To be added before online session

### 3.1.2 Forwarding of collected MDT information

R3-206514 propose to introduce a mechanism to exchange collected MDT information between nodes over Xn.

**Question: Can we agree to exchange collected MDT information between nodes over Xn**

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**Summary**

* To be added before online session

## 3.2 F1 functionality and related signalling

Applicable agreements and open issues listed below

**Agreements:**

DU signals to CU coverage related configuration information. Whether to include SSB beam information (on top of cell info) is FFS.

***Open issues:***

*FFS (on impact/usefulness) whether to support SSB beam coverage optimizations in NR CCO for beam coverage switching, SSB beam shaping/splitting/merging scenarios*

*FFS whether CCO Assistance Information is needed over F1AP for CU-CP to indicate gNB-DU with the type of CCO issue detected*

### 3.2.1 General

We have the agreement that DU informs the CU about coverage related information. A minimal subset of information would be to provide the same information as is exchanged with neighbour nodes over Xn. This is needed since the CU needs to send this information to neighbour nodes.

**Question: Can we agree that the DU (at least) sends the same information to CU as agreed to be exchanged over Xn.**

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| Company | Comment |
| HW | Yes |
| CATT | Yes |
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**Summary**

* To be added before online session

### 3.2.2 Detection of coverage issues

As mentioned in the open issues, it is to be discussed whether CCO assistance information is needed from CU to DU. But one first step is probably to further clarify the roles. Although not explicitly mentioned, it is assumed (by the moderator) that we can agree that the decision on corrections is performed in the DU. But it is probably good to also explicitly agree on this.

**Question: who is responsible for correcting the CCO issues, CU or DU**

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| Company | Comment |
| HW | The DU owns the radio resources and is responsible for correcting any CCO issue |
| CATT | Agree with Huawei |
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Next step is to discuss whether the DU has enough information to do this analysis, and whether he would benefit from additional information from the CU. This may e.g. include assistance information where the CU performs an analysis and sends the result to the DU. Note that in this case it may also be necessary to provide additional information from the DU to the CU to let the CU perform such analysis, i.e. the question below relates to information in both directions to/from the DU.

Note: In this question the moderator have assumed the agreement is that the DU is responsible for correcting CCO issues. If this is not agreeable, please outline the alternative preferred solution in the comments below.

**Question: Is additional information exchange Over F1 needed?**

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**Summary**

* To be added before online session

## 3.3 X2 functionality and related signalling

Applicable agreements and open issues listed below

*FFS whether EN-DC CCO Support over X2 is needed and should be deprioritized w.r.t CCO support in NR SA scenarios*

Here the question is whether there is any need for supporting CCO over X2. Regarding the basic functionality related to MRO, there is no direct impact. Hence the question is if there is any interest in additional functionality. One example is described in R3-206520.

**Question: Is there any interest in additional X2 functionality and in that case what?**

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**Summary**

* To be added before online session