3GPP TSG-RAN WG3#125bis draftR3-245717

Hefei, China, 14-18 October 2024

Agenda Item: 11.4

Source: Huawei

Title: Summary of Discussion on CB: # AIRAN3\_NR-DC

Document for: Discussions & Approval

# Introduction

**CB: # AIRAN3\_NR-DC**

**- Start with the SN addition and SN change as NR-DC scenarios and open issue above**

**- Capture agreements and provide TP if agreeable**

(moderator - HW)

Summary of offline disc [R3-245717](file:///C:\Users\d00829332\Desktop\TSGR3_125-bis\drafts\CB%20%23%20AIRAN3_NR-DC\Inbox\R3-245717.zip)

# For Chairman’s notes

**Proposal 1: As a starting point, SN Addition and MN-initiated SN Change procedures are considered to be enhanced to trigger the collection of UE performance from SN to MN. This assumes that the involved gNBs have an existing Data Collection Reporting Initiation procedure in place configuring the collection of UE performance.**

**Whether to use the Data Collection Reporting Initiation procedure to configure the collection of UE performance at SN side or whether to reuse existing DC procedure to configure the collection of UE performance at SN side and a new procedure for the reporting of UE performance need further discussion.**

# 3 Discussion

## 3.1 Scenarios for AI/ML-based NR-DC

In TR 38.843 clause 5.1 the following has been captured

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| 5.1 Mobility optimization for NR-DC  5.1.1 Use case description  Mobility in NR-DC can be optimized by means of AI/ML.  Mobility Optimization for NR-DC is studied by assuming inference at the MN only. The main use case is limited to Dual Connectivity only and Conditional Dual Connectivity procedures are out of scope.  5.1.2 Potential Standard impacts  The Dual Connectivity procedures (e.g., SN Addition, MN-initiated SN Change) are enhanced to trigger the collection of measured UE performance. |

Based on the above, it is moderator’s understanding that, ***as a starting point***, the “basic” NR-DC procedures, that is, SN Addition and MN-initiated SN Change, should be considered to be enhanced to transfer the UE performance from SN to MN. This does not preclude other DC-related scenarios as the ones described in [5][11] to be addressed as well, but once the “basic” NR-DC procedures are properly discussed and related agreements are achieved. Hence, the following is proposed for agreement:

**~~Proposal 1: As a starting point, SN Addition and MN-initiated SN Change procedures are considered to be enhanced to enable the transfer of UE performance from SN to MN.~~**

**Proposal 1: As a starting point, SN Addition and MN-initiated SN Change procedures are considered to be enhanced to trigger the collection of UE performance from SN to MN. This assumes that the involved gNBs have an existing Data Collection Reporting Initiation procedure in place configuring the collection of UE performance.**

**CMCC, E///, Lenovo, LGE, ZTE, TI, NEC, Interdigital, CATT, Samsung, Nokia, Jio, HW: support the two procedures as baseline**

**Nok: in legacy we don’t have configuration of UE performance from SN to MN, we only have it between two gNBs. The proposal assumes that MN and SN have an existing Data Collection Reporting Initiation procedure in place**

**Question 1**: Companies are invited to share their views on Proposal 1 above.

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| **Company** | **Support Proposal 1?** | **Comments** |
| Huawei | Yes | As indicated in the TR we should start from SN Addition and MN-initiated SN Change as the “basic” NR-DC procedures to be enhanced to enable transferring of UE performance from SN to MN |
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## 3.2 Procedures for AI/ML-based NR-DC scenarios

Still based on the previous statements, it is moderator’s understasting that the following was captured in Chair’s meeting minutes as the wording for an initial agreement on the topic of AI/ML-based NR-DC:

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| Using the Data Collection Reporting Initiation procedure to configure the collection of UE performance from SN to MN. Using the Data Collection Reporting procedure to report the UE performance from SN to MN after the execution of SN addition or SN change. |

**The above assumes that between two gNBs which are Xn-connected and that could become “future” MN and “future” SN there is an existing Data Collection Reporting Initiation procedure already in place (with the corresponding *Data Collection ID* IE) that is used to configure the collection and reporting of UE performance feedback from SN to MN.  
Therefore, the following is proposed for agreement, which is a rewording of the text captured in Chair’s meeting minutes:**

**~~Proposal 2: Using the Data Collection Reporting Initiation procedure to configure the collection of UE performance at SN side from SN to MN. Using the Data Collection Reporting procedure to report the UE performance from SN to MN after the successful execution of SN Aaddition or MN-initiated SN Cchange.~~**

**Whether to use the Data Collection Reporting Initiation procedure to configure the collection of UE performance at SN side or whether to reuse existing DC procedure to configure the collection of UE performance at SN side and a new procedure for the reporting of UE performance need further discussion.**

**Nok, QC: why we need to preconfigure all possible SNs with Data Collection Reporting Initiation?**

**QC: this could not be scalable**

**E///: this follows the existing subscription-based mechanism that we have since Rel-18; does it seem we need new procedures? Scalability problem is more on the handover not DC**

**Question 2**: Companies are invited to share their views on Proposal 2 above.

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| **Company** | **Support Proposal 2?** | **Comments** |
| Hauwei | Yes |  |
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**Moreover, the following was also captured in Chair’s meeting minutes**

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| Introduce the Data Collection ID IE into the SN Addition Request message to identify a Data Collection Reporting context? S-NODE MODIFICATION REQUEST and S-NODE RELEASE REQUEST messages? |

**If Proposal 2 above is agreeable and based on the above excerpt of Chair’s meeting minutes, then it is moderator’s understanding that DC-related messages to be enhanced to trigger the collection and reporting of UE performance need to be identified. Based on contributions submitted at this meeting, the following Proposal 3 could be discussed:**

**Proposal 3: Introduce the *Data Collection ID* IE into the S-NODE ADDITION REQUEST message to identify a Data Collection Reporting Context.**

**Question 3**: Companies are invited to share their views on Proposal 3 above.

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| **Company** | **Support Proposal 3?** | **Comments** |
| Hauwei | Yes |  |
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**Proposal 3 not discussed in the offline session**

**If Proposal 1, Proposal 2 and Proposal 3 above are agreeable, it is moderator’s understanding that there could be some room to agree a TP for BLCR to TS 38.423 reflecting such proposals. Moderator’s proposal is to work offline on the TP proposed in R3-245296 (NEC).**

**Proposal 4: Agree the TP to BLCR to TS 38.423 in R3-24xxxx (revision of R3-245296).**

**Question 4**: Companies are invited to share their views on Proposal 4 above.

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| **Company** | **Support Proposal 4?** | **Comments** |
| Hauwei | Yes |  |
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**Proposal 4 not discussed in the offline session**

## 3.3 UE performance feedback from SN to MN

It is moderator’s understating that first RAN3 needs to identify which UE performance metrics needs to be provided from SN to MN based on the configured bearer type at the SN side. For this purpose, the following was captured in Chair’s meeting minutes:

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| Take Table 1 in [R3-245420](file:///C:\Users\d00829332\Desktop\TSGR3_125-bis\drafts\Docs\R3-245420.zip) as the start point for analysing UE performance metrics enhancements in NR-DC so that SN-relevant UE performance metrics components can be collected by the SN and reported to the MN? |

Table 1 in R3-245420 is reported below for convenience

Table 1 - UE performance components in the SN side as a function of the bearer type.

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| **Bearer types** | **Average UE throughput DL/UL** | **Average Packet Delay DL** | **Average Packet Delay UL** | **Average Packet Loss DL** |
| **MN-terminated split bearer** | RLC level THP for SCG part. | D1, D2, measured in SCG. | D2.1, D2.2, measured in SCG. And potentially D1(if UE reports to SN). | RLC level packet loss for SCG part. |
| **SN-terminated split bearer** | RLC level THP for SCG part. | D1, D2, D4 measured in SCG. | D2.4 measured in SN.  And potentially D1(if UE reports to SN). | RLC level packet loss for SCG part. |
| **MN-terminated SCG bearer** | RLC level THP in SCG. | D1, D2, measured in SCG. | D2.1, D2.2, measured in SCG. And potentially D1(if UE reports to SN). | RLC level packet loss in SCG. |
| **SN-terminated MCG bearer** | No need to provide. | D4 measured in SN. | D2.4 measured in SN.  And potentially D1(if UE reports to SN). | No need to provide. |
| **SN-terminated SCG bearer** | RLC level THP in SCG. | Average packet delay DL calculated by SN. | Average packet delay UL calculated by SN. | RLC level packet loss in SCG. |

Since some UE performance metrics are measured at the RLC layer in the SN side – such as UE throughput DL/UL, packet loss, some components of the packet delay DL/UL – it is moderator’s understanding that as a starting point the following proposal could be agreeable:

**Proposal 5: Average UE throughput UL/DL and Average Packet Loss DL measured at SN side can be transferred from SN to MN for MN-terminated split bearer, MN-terminated SCG bearer, SN-terminated split bearer, SN-terminated SCG bearer and SN-terminated MCG beaerer.**

**FFS how to transfer UE packet delay DL/UL components for MN-terminated split bearer, MN-terminated SCG bearer, SN-terminated split bearer, SN-terminated SCG bearer and SN-terminated MCG beaerer**

**Question 5**: Companies are invited to share their views on Proposal 5 above.

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| **Company** | **Support Proposal 5?** | **Comments** |
| Hauwei | Yes |  |
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**Proposal 5 not discussed in the offline session**

## 3.4 Other aspects concerning the UE performance reporting

**In Chair’s meeting minutes the following aspects were also listed:**

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| In the case of NR-DC, introduce UE performance at the per DRB level over Xn for SN-terminated resources, reported from the SN to the MN?  Introduce predicted PSCell ID in the SN Addition procedure as one of assistance information?  The current measured UE trajectory collection configuration related signalling should be further enhanced to include the configuration for reporting information about UE trajectory in PSCells? |

**It is moderator’s understanding that the first item listed above concerns the granularity of UE performance feedback reported by the SN. Since there is an ongoing discussion on UE performance feedback for both Rel-18 and Rel-19 use cases, it is moderator’s suggestion to put on-hold such discussion at this meeting.**

**The same suggestion applies to assistance information (e.g. predicted PSCell ID in SN Addition procedure) and measured UE trajectory across PSCells.**

**Proposal 6: postpone the discussion on granularity and assistance information for UE performance feedback to the next meeting.**

**Question 6**: Companies are invited to share their views on Proposal 6 above.

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| **Company** | **Support Proposal 6?** | **Comments** |
| Hauwei | Yes | There was no room for further discussion about these aspects, at this meeting we should at least achieve some basic agreements for the sake of progressing. |
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**Proposal 6 not discussed in the offline session**

# 4 References

1. R3-245088, (TP to 38.423) Discussion on Mobility Optimization for NR-DC (ZTE Corporation)
2. R3-245420, AI/ML-based Mobility Optimization in NR-DC (Huawei)
3. R3-245508, AI/ML support for NR-DC (Ericsson, Jio)
4. R3-245115, Discussion on AI/ML for mobility in NR-DC (Samsung)
5. R3-245147, Discussion on AI/ML based Mobility Optimization for NR-DC (China Telecom)
6. R3-245148, (TP to TS38.423) Support of AIML based Mobility Optimization for NR-DC (China Telecom)
7. R3-245191, Discussion on AIML based Mobility Optimization for NR-DC (CMCC)
8. R3-245296, (TP to TS38.423) Split architecture and NR-DC mobility optimization (NEC)
9. R3-245442, (TP to BLCR 38.423) Discussion on UE performance feedback in AIML for NR-DC (Lenovo)
10. R3-245444, (TP to BLCR 37.340) AIML for NR-DC (Lenovo, CATT, ZTE Corporation, Samsung)
11. R3-245608, Procedures for AI/ML Mobility Optimization in NR-DC (Nokia, Jio)
12. R3-245509, (TP to 38.423) - AI/ML support for NR-DC (Ericsson, Jio)