**3GPP TSG-RAN WG2 Meeting #115-e *R2-2108932***

**Electronic, 9th – 27th August, 2021**

Agenda Item: 5.5

Source: Huawei, HiSilicon

Title: [AT115-e][Offline-602][POS] AI 5.5 Positioning corrections (Huawei)

**Document for: Discussion and Agreement**

# Introduction

This document is to handle the following email discussion:

* [AT115-e][602][POS] AI 5.5 Positioning corrections (Huawei)

 Scope: Handle the CRs in the following tdocs and determine conclusions:

* R2-2107329/R2-2107330
* R2-2108407

 Intended outcome: Agreed CRs (without comeback), report in R2-2108932

 Deadline: Tuesday 2021-08-24 0800 UTC

In this discussion, we will discuss the following CRs:

|  |  |  |
| --- | --- | --- |
| R2-2107329 | Correction to E-CID-R15 | Huawei, HiSilicon |
| R2-2107330 | Correction to E-CID-R16 | Huawei, HiSilicon |
| R2-2108407 | Correction for Roles of gNB and ng-eNB for positioning in release-15 | Ericsson |

With the consideration on the following LS from RAN3

[R2-2106928](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202108%20-%20RAN2_115-e%2C%20Online%5CExtracts%5CR2-2106928_R3-212802.docx) Reply LS on E-CID LTE measurement in Rel-15 measurements (R3-212802; contact: Huawei) RAN3 LS in Rel-15 NR\_pos-Core To:RAN2

* 1. Contact Information

|  |  |  |
| --- | --- | --- |
| **Company** | **Delegate name** | **Delegate email** |
| **CATT** | **Jianxiang Li** | **lijianxiang@datangmobile.cn** |
| **Nokia** | **Mani Thyagarajan** | **mani.thyagarajan@nokia.com** |
|  |  |  |

# Discussion

Background

During RAN2#113-e, the following dicsussion document and CR have been provided:

[R2-2101815](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202101-02%20-%20RAN2_113-e%2C%20Online%5CExtracts%5CR2-2101815%20Clarification%20on%20E-CID%20and%20NR%20E-CID.docx) Clarification on E-CID and NR E-CID Huawei, HiSilicon discussion Rel-15 NR\_newRAT-Core

[R2-2101816](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202101-02%20-%20RAN2_113-e%2C%20Online%5CExtracts%5CR2-2101816%20Correction%20to%20E-CID-R15.doc) Correction to E-CID-R15 Huawei, HiSilicon CR Rel-15 38.305 15.7.0 0063 - F NR\_newRAT-Core

[R2-2101817](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202101-02%20-%20RAN2_113-e%2C%20Online%5CExtracts%5CR2-2101817%20Correction%20to%20E-CID-R16.doc) Correction to E-CID-R16 Huawei, HiSilicon CR Rel-16 38.305 16.3.0 0064 - A NR\_newRAT-Core

Then, based on the discussion online, the following LS has been sent to RAN3 with the content of confirming with RAN3 the supported measurement by ng-eNB

[R2-2102104](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202101-02%20-%20RAN2_113-e%2C%20Online%5CExtracts%5CR2-2102104%20LS%20on%20E-CID%20LTE%20measurements.docx) (Draft LS from [611]) Huawei, HiSilicon LS out Rel-16 NR\_pos-Core To:RAN3

* Approved as R2-2102128

|  |
| --- |
| During RAN2#113-e, RAN2 discussed the support for gNB reporting E-UTRA measurements for UL E-CID positioning in Rel-15. RAN2 kindly requests RAN3 to confirm whether gNB can report E-UTRA measurement to the LMF for UL E-CID positioning in Rel-15. |

During last RAN3 meeting, an LS R2-2106928 has been sent from RAN3 with the following content in response:

|  |
| --- |
| **1. Overall Description:**RAN3 confirms that the gNB cannot report E-UTRA measurements to the LMF for UL E-CID positioning in Rel-15.**2. Actions:****To** **RAN WG1 and WG2.****ACTION:** RAN3 kindly ask RAN2 to take the above information into consideration. |

Discussion on the CR 7329/7330

During RAN2#115, the following two CRs have been provided, with generally the same content as the CR submitted to RAN2#113e

[R2-2107329](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202108%20-%20RAN2_115-e%2C%20Online%5CExtracts%5CR2-2107329%20Correction%20to%20E-CID-R15.doc) Correction to E-CID-R15 Huawei, HiSilicon CR Rel-15 38.305 15.8.0 0063 2 F NR\_newRAT-Core R2-2105052

[R2-2107330](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202108%20-%20RAN2_115-e%2C%20Online%5CExtracts%5CR2-2107330%20Correction%20to%20E-CID-R16.doc) Correction to E-CID-R16 Huawei, HiSilicon CR Rel-16 38.305 16.5.0 0064 2 F NR\_newRAT-Core R2-2105053

### R15 CR

The following change has been made in R2-2107329:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ==================================FIRST CHANGE==================================4.3.4 Enhanced Cell ID methodsIn the Cell ID (CID) positioning method, the position of an UE is estimated with the knowledge of its serving ng-eNB, gNB and cell. The information about the serving ng-eNB, gNB and cell may be obtained by paging, registration, or other methods.Enhanced Cell ID (E‑CID) positioning refers to techniques which use additional UE measurements and/or NG-RAN radio resource and other measurements to improve the UE location estimate.In this version of the specification, E-CID is supported for E-UTRA only. However, depending on the serving NG-RAN node e.g. ng-eNB, uplink E-CID may be supported based on GERAN, UTRA or WLAN signals.Although E-CID positioning may utilise some of the same measurements as the measurement control system in the RRC protocol, the UE generally is not expected to make additional measurements for the sole purpose of positioning; i.e., the positioning procedures do not supply a measurement configuration or measurement control message, and the UE reports the measurements that it has available rather than being required to take additional measurement actions.In cases with a requirement for close time coupling between UE and ng-eNB measurements (e.g., TADV type 1 and UE E-UTRA Rx-Tx time difference), the ng-eNB configures the appropriate RRC measurements and is responsible for maintaining the required coupling between the measurements.The operation of the Enhanced Cell ID method is described in clause 8.3.================================SECOND CHANGE==================================8.3.2.3 Information that may be transferred from the gNB to LMFThe information that may be signalled from gNB to the LMF is listed in table 8.3.2.3-1.Table 8.3.2.3-1: Information that may be transferred from gNB to the LMF

|  |
| --- |
| Information  |
|  |
|  |  |
|  |  |
|  |  |
| NR Measurement Results List: |
|  | - Cell Global Identifier /Physical Cell ID |
|  | - Cell Portion ID |

==================================END OF CHANGES=============================== |

**Q2: Do companies think the above changes in R2-2107329 are necessary with the content of LS R2-2106928?**

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comments |
| CATT | Yes |  |
| ZTE | Yes | The change is aligned with RAN3’s reply |
| Qualcomm | Yes |  |
| Nokia | Yes |  |
| Apple | Yes |  |
| Intel | Yes |  |
| vivo | Yes |  |

### R16 CR

The following change has been made in R2-2107330:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| ==================================FIRST CHANGE==================================4.3.4 Enhanced Cell ID methodsIn the Cell ID (CID) positioning method, the position of an UE is estimated with the knowledge of its serving ng-eNB, gNB and cell. The information about the serving ng-eNB, gNB and cell may be obtained by paging, registration, or other methods.Enhanced Cell ID (E‑CID) based on LTE signals positioning refers to techniques which use additional UE measurements and/or NG-RAN radio resource and other measurements to improve the UE location estimate. In the case of a serving ng-eNB, uplink E-CID may be supported based on NR, GERAN, UTRA or WLAN signals.Although E-CID based on LTE signals positioning may tilize some of the same measurements as the measurement control system in the RRC protocol, the UE generally is not expected to make additional measurements for the sole purpose of positioning; i.e., the positioning procedures do not supply a measurement configuration or measurement control message, and the UE reports the measurements that it has available rather than being required to take additional measurement actions.In cases with a requirement for close time coupling between UE and ng-eNB measurements (e.g., TADV type 1 and UE E-UTRA Rx-Tx time difference), the ng-eNB configures the appropriate RRC measurements and is responsible for maintaining the required coupling between the measurements.The operation of the Enhanced Cell ID based on LTE signals method is described in clause 8.3.==================================SECOND CHANGE=================================8.3.2.3 Information that may be transferred from the gNB to LMFThe information that may be signalled from gNB to the LMF is listed in table 8.3.2.3-1.Table 8.3.2.3-1: Information that may be transferred from gNB to the LMF

|  |
| --- |
| Information  |
| NR Measurement Results List: |
|  | - Cell Global Identifier /Physical Cell ID |
|  | - Cell Portion ID |

==================================END OF CHANGES================================= |

**Q2: Do companies think the above changes in R2-2107330 are necessary with the content of LS R2-2106928?**

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comments |
| CATT | Yes |  |
| ZTE | Yes | The change is aligned with RAN3’s reply |
| Qualcomm | Yes |  |
| Nokia | Yes |  |
| Apple | Yes |  |
| Intel | Yes |  |
| vivo | Yes |  |

Discussion on the CR8407

With similar reason for the changes above, CR R2-2108407 has also been proposed with the following contents:

|  |
| --- |
| **START OF CHANGES**4.2 Role of UE Positioning MethodsThe NG-RAN may utilise one or more positioning methods in order to determine the position of an UE.Positioning the UE involves two main steps:- signal measurements; and- position estimate and optional velocity computation based on the measurements.The signal measurements may be made by the UE or by the serving ng-eNB. The basic signals measured for terrestrial position methods are typically the LTE radio transmissions; however, other methods may make use of other transmissions such as general radio navigation signals including those from Global Navigation Satellites Systems (GNSSs).The positioning function should not be limited to a single method or measurement. That is, it should be capable of utilising other standard methods and measurements, as such methods and measurements are available and appropriate, to meet the required service needs of the location service client. This additional information could consist of readily available E-UTRAN or NG-RAN measurements.The position estimate computation may be made by the UE or by the LMF.**NEXT CHANGE**5.4.2 gNBThe gNB is a network element of NG-RAN that may provide information such as serving cell ID of a target UE and communicates this information to an LMF.5.4.3 ng-eNBThe ng-eNB is a network element of NG-RAN that may provide measurement results for position estimation and makes measurements of radio signals for a target UE and communicates these measurements to an LMF.The ng-eNB makes its measurements in response to requests from the LMF (on demand or periodically).An ng-eNB may serve several TPs, including for example remote radio heads and PRS-only TPs for PRS-based TBS positioning for E-UTRA.In this version of the specification, only ng-eNB based measurements are supported; i.e gNB based measurements are not in the scope.**END OF CHANGES** |

**Q3: Do companies think the above changes in R2-2108407 are necessary with the content of LS R2-2106928?**

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comments |
| CATT | Yes |  |
| ZTE | Yes  |  |
| Qualcomm | Yes, with comments | The last sentence is redundant. But if needed, it seem better to move the sentence to 5.4.2:"gNB based measurements are not supported in this version of the specification"(we have similar such sentences in the spec) |
| Nokia | Yes, with comments | - Change under section 4.2 is OK- Change under section 5.4.2 may not be essential since it only says gNB provides measurement information. It does not say gNB makes or performs the measurement. However, the change is acceptable.- The new text under section 5.4.3 should be under section 5.4.2 and we prefer the text suggested by Qualcomm, preferrable as a NOTE.  |
| Apple | Yes (with comments) | It is better to move the last change to 5.4.2 |
| Huawei, HiSilicon | No | We think that the gNB-based measurement is a bit confusing in the context of UL E-CID. In UL E-CID, the measurement is performed by the UE and sent to the gNB for RRM. Then, can we call it “gNB-based measurement”?For us, the changes are not applicable for UL E-CID, because in UL E-CID, there is no gNB measurement or ng-eNB measurements |
| Intel | Yes with comments | The changes in 4.2 is ok. Rest parts may not be needed.  |
| vivo | Yes with comments | The changes in section 4.2 and 5.4.2 are ok.For the change in section 5.4.3, we prefer to move it to section 5.4.2 and rewording as follow:In this version of the specification, gNB cannot provide measurement results for position estimation. |

# Conclusion

**TBD**

# 4 References