**3GPP TSG RAN WG3 Meeting # 116-e R3-223890**

**e-meeting, 9- 20th May 2022** *rev of R3-223687*

**Title: CB: # NTN1\_NRNTN - Summary of email discussion (3rd round)**

**Source: Thales (moderator)**

**Type: discussion**

**Document for: Agreement**

**Agenda Item: 9.1.7.1**

**Work Item: Rel-17 NR\_NTN\_solutions: Solutions for NR to support non-terrestrial networks (NTN)\**

# Introduction

This document aims at discussing and agree on CRs related to the Rel-17 WI NR\_NTN\_solutions.

Hereunder is recalled the description of the email discussion as defined by the RAN3 chair in its notes:

**CB: # NTN1\_NRNTN**

**- Check incoming LSs**

**- Add serving PLMN info in ULI?**

**- Introduce SIB 19 over F1?**

**- Reply LS to RAN2?**

**- Other stage2/3 updates if needed**

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

(Thales - moderator)

Summary of offline disc [R3-223687](file:///C%3A%5CUsers%5Cchuberrn%5CDocuments%5C000_DATA_NICOLAS%5C02_3GPP%20Nicolas%5CRAN3%5CMeetings%5C220509_RAN3%23116-e%20meeting%5CSatellite%20contributions%5CD_Come%20backs%5CCB%23%20NTN1_NRNTN%5CInbox%5CR3-223687.zip)

The following TDOCs are considered as part of this discussion:

|  |  |  |
| --- | --- | --- |
| [R3-223009](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223009.zip) | LS on UE location during initial access in NTN (RAN2) | LS in |
| [R3-223020](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223020.zip) | LS on UE location in connected mode in NTN (RAN2) | LS in |
| [R3-223031](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223031.zip) | Reply LS on RAN Initiated Release due to out-of-PLMN area condition (SA2) | LS in |
| [R3-223099](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223099.zip) | Adding serving PLMN information in ULI for NTN (Qualcomm Incorporated) | CR0776r, TS 38.413 v17.0.0, Rel-17, Cat. F |
| [R3-223234](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223234.zip) | Discussion on remaining issues of NTN and NTN-IoT (Huawei, Deutsche Telekom) | discussion |
| [R3-223236](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223236.zip) | Correction to 38.473 for capturing SIB19 (Huawei, Deutsche Telekom) | CR0885r, TS 38.473 v17.0.0, Rel-17, Cat. F |
| [R3-223237](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223237.zip) | Correction to 38.470 for capturing SIB19 (Huawei, Deutsche Telekom) | CR0093r, TS 38.470 v17.0.0, Rel-17, Cat. F |
| [R3-223254](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223254.zip) | Discussion on corrections for LTE IOT NTN and NR NTN (Nokia, Nokia Shanghai Bell) | discussion |
| [R3-223256](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223256.zip) | Corrections for NR NTN (Nokia, Nokia Shanghai Bell) | draftCR |
| [R3-223271](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223271.zip) | Views on UE location aspects for NR NTN (CATT) | discussion |
| [R3-223272](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223272.zip) | draft CR to TS 38.300 correction on NR NTN (CATT) | draftCR |
| [R3-223339](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223339.zip) | [DRAFT] Reply LS on UE location during initial access in NTN (Ericsson LM) | LS out To: RAN2 CC: CT1, SA3, SA2 |

The following documents can be noted

* R3-223020 LS on UE location in connected mode in NTN (RAN2) LS in
	+ No action for RAN3

# For the Chairman’s Notes

Propose the following:

**No need to prepare a LS response to incoming LS in R3-223009 “LS on UE location during initial access in NTN (RAN2)”**

**CR 38.473 in [R3-223236] noted**

**CR 38.470 in [R3-223237] revised in [R3-223872] and agreed**

**CR 38.300 in [R3-223256] revised in [R3-223890] and agreed unseen**

Propose to capture the following:

# 1st round discussion

## Out of PLMN handling

List of relevant TDOCs:

|  |  |  |  |
| --- | --- | --- | --- |
| [R3-223031](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223031.zip) | Reply LS on RAN Initiated Release due to out-of-PLMN area condition (SA2) | LS in | SA2 would like to thank RAN3 for the LS on RAN Initiated Release due to out-of-PLMN area condition (R3-221379). SA2 would like to confirm RAN3’s understanding and has agreed corresponding CRs as attached. |
| [R3-223099](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223099.zip) | Adding serving PLMN information in ULI for NTN (Qualcomm Incorporated) | CR0776r, TS 38.413 v17.0.0, Rel-17, Cat. F | A Serving PLMN IE is added to the NR NTN TAI Information IE.In addition, the UE location derived TAI in NR NTN IE is changed to a TAC, both in reference and its name (as the TAI can be derived using the newly signalled serving PLMN).This CR is strictly non-backward compatible as it introduces a new mandatory IE, and changes the reference of an existing IE.Impact Analysis:Impact assessment towards the previous version of the specification (same release): This CR has limited impact on the previous version of the specification, as it changes only an NTN specific IE within the User Location Information IE. |

**Question 3.1.1: Do companies agree to the proposed CR 38.413 in [R3-223099] ?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree/not agree** | **Comment** |
| Thales | Agree |  |
| CATT | Agree |  |
| Deutsche Telekom | Agree |  |
| Qualcomm | Agree | As proponents, we think that for sure something like this seems needed, of course other options can be considered. |
| Nokia | Agree with comments | Question on changing the UE location derived **TAI** to **TAC**, the UE may be near the country border and in another country (i.e. out of the area of the serving PLMN), does this assume a special TAC value will be used to indicate the UE is out of the country? |
| Ericsson | Disagree – needs further clarification | What is 3099 trying to solve: is there a problem at all? If it is confirmed that a problem actually exists, it might be addressed simply by *not* ignoring the legacy TAI IE, as per our proposal at the previous meetings. Unless the above is clarified, 3099 is not agreeable. |
| China Telecom | Agree |  |
| Qualcomm | To address comments, if I may | To Nokia: we can discuss, but indeed this was my assumption i.e. the PLMN should only be told about its own TACs as part of ULI.To Ericsson: the problem is described in the paper i.e. in some access cases the system needs indication of the selected PLMN (in msg5) to be reflected in the TAI (i.e. the signalled TAI implicitly provides the UE’s selected PLMN) – for example during initial registration, and for sharing case; but in general the expectation is anyway to receive TAI. This is just legacy behaviour. So independently of the discussion we had last time, PLMN needs to be signalled so we don’t break anything.On the lines of your comment, there is another option we discuss, which is to change the semantics to indicate that the PLMN of the legacy IE is not ignored, but this seems a little messy. Trying to reuse the full legacy IE is possible as already discussed last time, but then we reopen the whole discussion for what is an orthogonal aspect to the previous discussion. So, both seem not preferred. |
| ZTE | Agree |  |
| CMCC | Agree, but needs further consideration | We must admit that adding a serving PLMN IE to the new NR NTN TAI Information IE is simpler than modifying semantics. But like Nokia’s said, there needs further discussion on the scenario where a UE may be near the country border and in another country. |
| Huawei | Agree | With the clarification of QC, we think the proposal in 3099 is reasonable, which can be considered as a complement to the agreements we achieved in the previous meeting. By the way, it is a bit strange that there are no TAIs (only TAC) within a ‘NR NTN TAI Information’ IE. |

**Moderator’s summary:**

Most companies are in agreement with the CR. However Ericsson disagreed unless QC provided some clarifications which QC did but Ericsson didn’t hjave time to review.

So let us continue the discussion in 2nd round

## Capturing SIB19

List of relevant TDOCs:

|  |  |  |  |
| --- | --- | --- | --- |
| [R3-223234](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223234.zip) | Discussion on remaining issues of NTN and NTN-IoT (Huawei, Deutsche Telekom) | discussion | Observation 1: Lack of accurate GNSS location information after AS security has no severe impact to functionality and RAN3 for NR NTN.Observation 2: The information in the SIB19 is more related with the configuration in the gNB-DU.Observation 3: During handover, the gNB-DU needs to configure the NTN information including the ephemeris information to the UE.Proposal 1: It is suggested to align NTN-IoT stage 2 with NR NTN stage 2 regarding the cell mapping.Proposal 2: The SIB 19 is encoded by the gNB-DU. Corresponding changes in 38.473 and 38.470 are needed. |
| [R3-223236](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223236.zip) | Correction to 38.473 for capturing SIB19 (Huawei, Deutsche Telekom) | CR0885r, TS 38.473 v17.0.0, Rel-17, Cat. F | Add SIB 19 in gNB-DU System information IE which should contain all the system information generated by gNB-DU |
| [R3-223237](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223237.zip) | Correction to 38.470 for capturing SIB19 (Huawei, Deutsche Telekom) | CR0093r, TS 38.470 v17.0.0, Rel-17, Cat. F | Add SIB 19 related descriptions in the section of 5.2.2 System Information management function |

**Question 3.2.1: Is the CR 38.473 in [R3-223236] agreeable ?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree/not agree** | **Comment** |
| Thales | Agree |  |
| CATT | Agree |  |
| Deutsche Telekom | Agree |  |
| Qualcomm | Agree |  |
| Nokia  | Agree |  |
| Ericsson | Agree proposal 1; disagree with proposal 2 | OK to align IoT NTN stage 2 with NR NTN stage 2 (proposal 1). On proposal 2 (impact F1AP and F1 stage 2), we need to clarify a) whether there are gNB-CUs and gNB-DUs in Rel-17 NR NTN architecture? and b) if so, what does the gNB-CU do with this information? (i.e. is it just for configuration information gathering, or does the CU use this information for something?) 3236 and 3237 cannot be agreed if we don’t clarify the above. Ericsson has serious doubts that the answer to a) and b) is “yes”. |
| China Telecom | Agree proposal 1; disagree with proposal 2 | Agree with E///. |
| ZTE | Disagree | We share the view with Ericsson. In Rel-17, the F1 interface or CU-DU split architecture for NTN should be precluded, we have not agreed any agreement related to F1 so far. |
| CMCC | Agree proposal 1; disagree with proposal 2 | Share the same view with Ericsson. In rel-17, we do not fully discuss the split architecture for NTN scenario. |
| Huawei | see comments | This is in fact a dilemma as expected. Usually, we think such change is necessary without a doubt, but we also understand the existence of F1 is always a problem for R17, so the main intention of the two CRs is trying to reach a consensus that such SIB are generated in DU. Our answer to question a) is F1 is not precluded, but also there are no proof that we will have such architecture. We tend to agree we need such CR because not precluded means we may have F1 for future proof. If the group believe there is no F1 for NTN for sure in R17, maybe we need to consider some notes in stage 2, clearly state F1 is not supported. But I guess this is also controversial…The answer to question b) of Ericsson is we believe such synchronization is needed between CU and DU, CU simply need to aware it. It is a common practice for RAN3 to do such exchange.So, if no immediate result, we suggest we can at least note RAN3 acknowledge SIB 19 is generated in DU. Then, moderator can decide whether we discuss the existence of F1 in R17 in second round…Intrinsically, this is not a question about whether agree the two CRs but whether we believe we have F1 interface. |

**Moderator’s summary:**

Views on

* Proposal 1: It is suggested to align NTN-IoT stage 2 with NR NTN stage 2 regarding the cell mapping. => Most companies agree
* Proposal 2: The SIB 19 is encoded by the gNB-DU. Corresponding changes in 38.473 and 38.470 are needed. => 4 companies out of 10 disagree

For P1, this should be discussed in CB#NTN2 email discussion

As per P2, Huawei suggests to add a note clarifying that “the SIB 19 is generated in DU”

The topic is further discussed in round 2

**Question 3.2.2: Is the CR 38.470 in [R3-223237] agreeable ?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree/not agree** | **Comment** |
| Thales | Agree |  |
| CATT | Agree |  |
| Deutsche Telekom | Agree |  |
| Qualcomm | Agree |  |
| Nokia | Agree |  |
| Ericsson | Disagree | See our comment above |
| China Telecom | Disagree |  |
| ZTE | Agree | See comment above |
| CMCC | Disagree |  |
| Huawei | Agree if 3236 is agreeable |  |

**Moderator’s summary:**

6 companies agree, 3 companies disagree, 1 is neutral

The CR is not agreed

## Mapped cell Id handling

List of relevant TDOCs:

|  |  |  |  |
| --- | --- | --- | --- |
| [R3-223254](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223254.zip) | Discussion on corrections for LTE IOT NTN and NR NTN (Nokia, Nokia Shanghai Bell) | discussion | Proposal 1: clarify the mapped cell ID determination and MME (re-)selection is also applicable to NB-IOT UE that supports S1-U data transfer or User Plane CIOT EPS optimisation.Proposal 2: agree the corrections to LTE Stage-2 TP ([2]).Proposal 3: agree the corrections to NR Stage-2 TP ([3]).Proposal 4: Update S1AP to remove LTE-M Satellite Indication IE, and the related behavior text.Proposal 5: rapporteur CR to add the assigned criticality “ignore” for the RAT Restriction IE in S1AP and X2AP. |
| [R3-223256](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223256.zip) | Corrections for NR NTN (Nokia, Nokia Shanghai Bell) | draftCR | Move the text for the mapped configuration from the NOTE paragraph to a normative paragrah.Impact Analysis:Impact assessment towards the previous version of the specification (same release): This CR has limited impact under funtional point of view, since it clarifies the mapping configuration for the Mapped Cell ID is configured in the RAN and Core Network |
| [R3-223272](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223272.zip) | draft CR to TS 38.300 correction on NR NTN (CATT) | draftCR | The description of Mapped Cell ID in section 16.14.5 is not accurate enough, which may cause confusion, even lead to mis-understanding.“The Cell Identity, as defined in TS 38.413 [26] and TS 38.423 [50], used in following cases corresponds to a Mapped Cell ID, irrespective of the orbit of the NTN payload or the types of service links supported. “- Actually, the cell ID in the following cases may not always be the mapped Cell ID, e.g. the in the ULI of the INITIAL UE MESSAGE message, as there’s no UE location info to do accurate CGI mapping, the gNB may not be able to map the Cell ID to a geographysical area.“The Cell Identity included within the target identification of the handover messages allows identifying the correct target cell.”- Not clear enough what’s the handover messages means here, Uu handover messages or Xn/NG handover messages? As mapped Cell ID is only known by gNB and Core Network, obviously, it means Xn/NG. “The mapping between Cell Identities and geographical areas is configured in the RAN and Core Network.”- The Cell Identities here should represent for Mapped Cell IDs.=> Make corresponding changes to make the texts more accurate. |

**Question 3.3.1: Is the draft CR 38.300 in [R3-223256] agreeable ?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree/not agree** | **Comment** |
| Thales | Agree |  |
| CATT | Agree | Just one thing to be mentioned:As we defied the  “Mapped Cell ID” , we should use it to replace the “Mapped Cell Identities” or “ Mapped Cell identifiers”. |
| Deutsche Telekom | Agree | We support CATT’s proposal for replacement. |
| Qualcomm | Agree |  |
| Nokia | Agree | Ok for CATT proposal.  |
| Ericsson | Agree in principle but CR needs revising | The existing sentence "The mapping may be pre-configured…" should not be moved. Other changes seem OK. |
| China Telecom | Agree | Ok for CATT’s proposal.  |
| ZTE | Agree | Ok for CATT’s suggestion. |
| CMCC | Agree | Ok for CATT’s proposal.  |
| Huawei | Agree |  |

**Moderator summary**

There is a consensus to agree the proposed changes the draft CR 38.300 in [R3-223256] but with a correction suggested by Ericsson. "The mapping may be pre-configured…" should not be moved

**Question 3.3.2: Is the draft CR 38.300 in [R3-223272] agreeable ?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree/not agree** | **Comment** |
| Thales | Agree |  |
| CATT | Agree | Maybe the draft CR 3256 and 3272 could be merged together. |
| Deutsche Telekom | Agree | We also have a preference for a merged CR. |
| Qualcomm | Not all | Would also prefer a merge but the first change is justified by not having explicit location information, but actually this is pre-empted by the Note 3. So seems not needed. |
| Nokia | Agree with comments | The first change “may” is not needed.  |
| Ericsson | Disagree | 1st change is not needed because there's no ambiguity (i.e., all HOs are either Xn or NG); with respect to 2nd change, it's unclear what the issue with the current text actually is, so the 2nd change is most likely not needed. |
| ZTE | Partially agree | The first two changes, i.e. “may” and “Xn/NG”, are not needed. |
| CMCC | Agree |  |
| Huawei | Partly agree | 1. We agree the change regarding mapped cell ID.
2. We don’t think ‘may’ is needed. Even for the case “in the ULI of the INITIAL UE MESSAGE message” It can still be considered as mapped cell, we are just doing mapping with different granularities.
3. Neutral about whether add Xn/NG
 |

**Moderator’s summary:**

The first two changes, i.e. “may” and “Xn/NG”, are discarded.

Considering the outcome of the two discussions, the TP to 38.300 would become

“*The Cell Identities used in the RAN Paging Area during Xn RAN paging allow the identification of the correct target cells for RAN paging.*

*NOTE 1: The Cell Identity used for RAN Paging is assumed to typically represent a Uu Cell ID.*

*The mapping between Mapped Cell IDs and geographical areas is configured in the RAN and Core Network.*

*NOTE 2: A specific geographical location may be mapped to multiple Mapped Cell ID(s), and such Mapped Cell IDs may be configured to indicate differerent geographical areas (e.g. overlapping and/or with different dimensions).*

*The gNB is responsible for constructing the Mapped Cell ID based on the UE location info received from the UE, if available. The mapping may be pre-configured (e.g., up to operator's policy) or up to implementation.*

*NOTE 3: As described in TS 23.501 [3], the User Location Information may enable the AMF to determine whether the UE is allowed to operate at its present location. Special Mapped Cell identifiers may be used to indicate areas outside the serving PLMN's country.*”

## UE location aspects

List of relevant TDOCs:

|  |  |  |  |
| --- | --- | --- | --- |
| [R3-223009](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223339.zip) | LS on UE location during initial access in NTN (RAN2) | LS in | RAN2 had decided (see R2-2109216) that the UE may report to the NG-RAN its coarse GNSS coordinates during initial access (before AS security is activated).The reporting would be under network control (i.e. it could be disabled if/when needed). Following liaisons from SA2, SA3 and RAN3 (see R2-2200145/S2-2109337, R2-2200149/S3-214360, R2-2202542/S3i200056) on this, RAN2 is discussing how to progress and requires the views of SA2 and RAN3 to take its decision.Due to possible privacy issues indicated by SA3, RAN2 is likely to decide that UE does not report to the NG-RAN its coarse GNSS coordinates during initial access (before AS security is activated), for example, for service request and registration area update procedures. RAN2 assumes UE location information can be reported after AS security is activated and network has NTN specific user consent. RAN2 has asked SA3 to work on the NTN specific user consent in Rel-17. RAN2 also understands that, if needed, NG-RAN can reselect an AMF serving a PLMN corresponding to the available UE's current location. This location can be determined by the AMF by invoking UE location procedure (LCS) in connected mode(once AS security is activated) and provided to the NG-RAN.RAN2 would then like to ask SA2/RAN3 if it's acceptable that no UE location information is reported at the NG-RAN in a NTN network during initial access. |
| [R3-223339](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223339.zip) | [DRAFT] Reply LS on UE location during initial access in NTN (Ericsson LM) | LS out To: RAN2 CC: CT1, SA3, SA2 | Proposal to RAN2 as follow:“At initial access the RAN uses user location information, if available and/or provided by the UE, to assist the selection of an appropriate core network node for the UE. In the absence of any such information, core network node selection will be performed based on available information, typically including serving cell, PLMN, and TAC.RAN3 confirms RAN2’s assumption that in case an incorrect AMF is selected, the NG-RAN can re-select a correct one upon triggering UE context release. Appropriate deployment and network configuration should make this a rare case.Whether an AMF which is not the appropriate one for the UE can trigger a location procedure (LCS) for that UE, may depend on AMF configuration.With the above in mind, RAN3 considers it acceptable that no UE location information is reported to the NG-RAN at initial access for NTN.” |
| [R3-223271](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223271.zip) | Views on UE location aspects for NR NTN (CATT) | discussion | Observation 1: From RAN3 point of view, it’s acceptable that no UE location information is reported from UE in a NTN network during initial access.Observation 2: RAN3 understands that it’s feasible for AMF to obtain the UE location info via LCS services, but RAN3/SA2 never discussed and agreed to provide the UE location info from 5GC to NG-RAN for any purpose.Observation 3: RAN3 share the view with RAN2 that implicit user consent approach could be considered in Rel-17.Observation 4: No further action required for RAN3 on the out-of-PLMN release case.Proposal 1: Reply the LS to RAN2 with following info:- it’s acceptable that no UE location information is reported from UE in a NTN network during initial access.- it’s feasible for AMF to obtain the UE location info via LCS services, but RAN3/SA2 never discussed and agreed to provide the UE location info from 5GC to NG-RAN for any purpose.Proposal 2: Discuss and agree the draft LS reply in the section 5. |
| *R3-221357* | *LS on UE location during initial access in NTN* | *LS in* | *RAN2 had decided (see R2-2109216) that the UE may report to the NG-RAN its coarse GNSS coordinates during initial access (before AS security is activated).The reporting would be under network control (i.e. it could be disabled if/when needed).* *Following liaisons from SA2, SA3 and RAN3 (see R2-2200145/S2-2109337, R2-2200149/S3-214360, R2-2202542/S3i200056) on this, RAN2 is discussing how to progress and requires the views of SA2 and RAN3 to take its decision.**Due to possible privacy issues indicated by SA3, RAN2 is likely to decide that UE does not report to the NG-RAN its coarse GNSS coordinates during initial access (before AS security is activated), for example, for service request and registration area update procedures. RAN2 assumes UE location information can be reported after AS security is activated and network has NTN specific user consent. RAN2 has asked SA3 to work on the NTN specific user consent in Rel-17. RAN2 also understands that, if needed, NG-RAN can reselect an AMF serving a PLMN corresponding to the available UE's current location. This location can be determined by the AMF by invoking UE location procedure (LCS) in connected mode(once AS security is activated) and provided to the NG-RAN.**RAN2 would then like to ask SA2/RAN3 if it's acceptable that no UE location information is reported at the NG-RAN in a NTN network during initial access.* |
| *R3-222861* | *Reply LS on UE location during initial access in NTN (Thales)* |  | *RAN3 thanks RAN2 for its Liaison in which the following questions was submitted:**Is it acceptable that no UE location information is reported at the NG-RAN in a NTN network during initial access ?**RAN3’s response can be found below:**Without knowledge of the UE location during the initial access, the gNB may not be able to select the correct AMF.**If this happens, the incorrect AMF de-registers the UE, asks the UE to re-register and may inform NG-RAN with an appropriate NGAP cause value in the NGAP UE CONTEXT RELEASE COMMAND message. On subsequent network access attempt by the UE, the NG-RAN may be able to select the right AMF based on the information from the UE. This translates into a risk of extended UE registration (or connection set-up), but only in extreme cases of large radio cell covering more than 1 country, and only at the transition to RRC CONNECTED state or after significant UE movement.**In addition, the initial mapped cell ID reported over NGAP may not be able to provide the level of granularity that has been requested by SA groups, but it has previously been clarified that this is acceptable at initial access.**There are no significant impacts in RAN3 specifications resulting from this change.**Overall RAN3 confirms that the above is acceptable from RAN3 point of view.* |

**Question 3.4.1: Does RAN3 agree to prepare a response to RAN2 LS in [R3-223009] ?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree/not agree** | **Comment** |
| Thales | Not agree | Actually R3-223009 = R3-221357.Already RAN3 responded to R3-221357 with R3-222861We do not think it is necessary to send a 2nd response to the same LS |
| CATT | Neutral | CATT also provide a draft LS Reply in 3271.1. For the RAN2 question in the Lsin,

*RAN2 would then like to ask SA2/RAN3 if it's acceptable that no UE location information is reported at the NG-RAN in a NTN network during initial access.*It seems RAN3 has answered this question in previsous LS out, not necessarily to repeat.1. But in the LS, RAN2 also provided the following assumption, which is mismatched with RAN3 agreements/designs.

*RAN2 also understands that, if needed, NG-RAN can reselect an AMF serving a PLMN corresponding to the available UE's current location. This location can be determined by the AMF by invoking UE location procedure (LCS) in connected mode(once AS security is activated) and provided to the NG-RAN.***[RAN3 view]**:From RAN3 point of view, it’s feasible for AMF to obtain the UE location info via LCS services, but RAN3/SA2 never discussed and agreed to provide the UE location info from 5GC to NG-RAN for any purpose.Should we reply on this to clarify the progress of RAN3? |
| Deutsche Telekom | Neutral | As Thales raised in their feedback, there is in principle no need to provide a second Reply LS. It may be only reasonable, if the mismatch noted by CATT is worth to be mentioned. |
| Qualcomm | Tending to no | It seems that there is no real need. Indeed that detail in RAN2’s reply is incorrect, and RAN2 should never even have gone into that point, but not clear that it makes a practical difference (that would make it worth responding). |
| Nokia | No | SA2 already said “No” to RAN2 question “*AMF by invoking UE location procedure (LCS) in connected mode(once AS security is activated) and provided to the NG-RAN.*”  |
| Ericsson | Agree | As mentioned by CATT, the issue RAN2 mentions (triggering LCS in conjunction with NNSF) is not something which is explicitly mentioned in specifications. It seems reasonable that it’s not precluded via e.g. AMF configuration, and it’s beneficial to point this out. |
| China Telecom | Neutral | No further clarification seems necessary. |
| ZTE | Neutral | The reply is not essential, but ok if the majority of companies want it. |
| CMCC | Neutral | There indeed exists a mismatch pointed out by CATT, but should we really need to send a reply LS to RAN2 telling them the mismatch? |
| Huawei | Not agree | We don’t see such need, the reply is not essential |

**Moderator’s summary:**

Already this RAN2 LS has been responded by RAN3. However a complementary response could be provided by RAN3 to highlight a mismatch in RAN2 LS sentence “*This location can be determined by the AMF by invoking UE location procedure (LCS) in connected mode(once AS security is activated) and provided to the NG-RAN.”* Since this is not supported as SA2 explicitly said.

On the basis of the above, most of companies believes that there is no strong need to prepare a complementary reply to RAN2.

* **No need to prepare a LS response to the R2-223009**

**Question 3.4.2: Can Ericsson proposed LS response [R3-223339] be considered as basis for the discussion ?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree/not agree** | **Comment** |
| Thales | Not agree | See above |
| CATT | Neutral | If reply, we should indicate that RAN2 made the wrong assumption in their LS that NG-RAN could obtain the UE location info from 5GC, refer to the 2nd part of 3271. |
| Deutsche Telekom | Neutral | See answer to Question 3.4.1 |
| Qualcomm | Neutral | We are not sure that further response is needed, but no strong view if majority thinks there is clear need. |
| Nokia | No | RAN3 already send several LS on this issue. with the SA2 LS, there is nothing new from RAN3.  |
| Ericsson | Agree | See comment above |
| China Telecom | Neutral |  |
| ZTE | No | As point out by Thales and Nokia, RAN3 has already replied the LS in R3-222861. |
| CMCC | Neutral | See comment above |
| Huawei | No |  |

**Moderator’s summary:**

See previous Moderator’s summary:

**Question 3.4.3: Can RAN3 agree with Ericsson proposed LS response [R3-223339] ?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree/not agree** | **Comment** |
| Thales | Not agree | See above |
| CATT | Neutral | See comments above. |
| Deutsche Telekom | Neutral | See answer to Question 3.4.1 |
| Qualcomm |  | See above |
| Nokia | No | See comments above |
| Ericsson | Agree | See comment above |
| China Telecom | Neutral |  |
| ZTE | No | See comment above |
| CMCC | Neutral | See comment above |
| Huawei | No |  |

**Moderator’s summary:**

See previous Moderator’s summary:

# 2nd round discussion

## Out of PLMN handling

Recall of 1st round discussion on proposed CR in [R3-223099](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223099.zip)

* Ericsson asked about what is 3099 trying to solve: is there a problem at all? If it is confirmed that a problem actually exists, it might be addressed simply by *not* ignoring the legacy TAI IE, as per our proposal at the previous meetings. Unless the above is clarified, 3099 is not agreeable.
* Qualcomm responded: the problem is described in the paper i.e. in some access cases the system needs indication of the selected PLMN (in msg5) to be reflected in the TAI (i.e. the signalled TAI implicitly provides the UE’s selected PLMN) – for example during initial registration, and for sharing case; but in general the expectation is anyway to receive TAI. This is just legacy behaviour. So independently of the discussion we had last time, PLMN needs to be signalled so we don’t break anything. On the lines of E/// comment, there is another option we discuss, which is to change the semantics to indicate that the PLMN of the legacy IE is not ignored, but this seems a little messy. Trying to reuse the full legacy IE is possible as already discussed last time, but then we reopen the whole discussion for what is an orthogonal aspect to the previous discussion. So, both seem not preferred.

In order to move forward, the following questions are submitted to companies.

**Question 4.1: What is the problem to solve in the proposed CR 38.413 in [R3-223099]?**

|  |  |
| --- | --- |
| **Company** | **Comment** |
| Nokia | 3099 is ok. We propose to add a sentence to indicate a special TAC may be configured to indicate the UE is out of the serving area of the PLMN. This may be added in the semantics description of the *UE location derived TAC in NR NTN* IE, Or added in 38.300. For example, Update 38.300 text as belowPre-configuration of special mapped cell identifiers or TACs may be used to indicate areas outside the serving PLMN's country. |
| Huawei | We don’t think there are big problems without 3099, but we acknowledge the clarification of QC in the first round.  |
| Deutsche Telekom | We are fine with 3099. No objections against Nokia’s proposal to update St2. |
| Ericsson | According to the clarification provided, it seems we broke legacy behavior by ignoring the legacy IE; now it is discovered that this is a problem, and the proposed solution would be to add yet another IE. Probably the best way to solve this issue is by reverting the previous change, i.e. removing the statement that the legacy IE is ignored. Maybe we should discuss this online for better understanding. |
| ZTE | Fine with Ericsson’s suggestion to revert the previous change that the legacy IE is ignored. Of course, we could further discuss this issue in online session. |
| CMCC | We agree with adding the semantic description proposed by Nokia. |
| CATT | 3099 pointed out the issue that if the legacy IE is ignored, the serving PLMN is not indicated in ULI.On how to address the issue, either taking 3099 solution, i.e. add a new IE, or as Ericsson proposed, reverting the semantics description for legacy TAI IE. |
| Qualcomm | The problem was already explained, we simply forgot to add PLMN in the new IE and in fact strictly do not need TAI (PLMN) in the location based IE, it is a simple swap round. It was an oversight and nothing to do with last meeting’s discussion or using or not using the legacy IE.Reverting to using the legacy IE will open up the same discussions as last meeting – it simply does not work a lot of other changes – so let’s not reopen that.Fine with adding Nokia’s proposal for stage 2. |
| Samsung | Compare between revert the semantics and adding a new IE, we think adding a new IE is better. Only the PLMN identity in the legacy TAI should not be ignored. This kind of description is a little bit unclean. |

Moderators

2 companies wants to revert to handling of legacy IE (and abandon the ignorance of legacy IE)

6 companies are supporting the proposed CR 38.413 with the addition of a new IE (In addition, they seems to agree with Nokia’s proposal to add a clarification in 38.300 as follow “Pre-configuration of special mapped cell identifiers or TACs may be used to indicate areas outside the serving PLMN's country.”

1 company is neutral

Moderator suggests to continue on line the discussion

**Question 4.2: If there is a problem, Would it be agreeable to just remove the new semantic that was added and therefore this will require to consider the PLMN of the legacy IE ?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree/not agree** | **Comment** |
| Nokia |  | We prefer to introduce a new IE as proposed by 3099. It is not good to not ignore the PLMN but ignore other.  |
| Huawei |  | In theory, both are ok. But we think the proposal in 3099 is clearer as per SA2’s requirements and the discussion in the last meeting. |
| Deutsche Telekom |  | Preference for the proposal in 3099 to introduce a new IE. |
| Ericsson | Disagree | See previous comment. Some companies were adamant that we needed to ignore the legacy IE, so we broke legacy behavior and now the same companies discover that we created a problem. It seems logical to revert such change now. |
| ZTE |  | Similar view as Ericsson. |
| CMCC |  | Prefer to introduce a new IE as proposed by 3099. |
| CATT |  | Either way is fine, slightly prefer adding a new IE as proposed in 3099. |
| China Telecom |  | Prefer to introduce a new IE. |
| Qualcomm | Agree | Go for 3099. There is absolutely no point to reverting last meeting’s decision, the issue to fix is primarily one of the detail in the agreed solution and nothing to do with the decision of last meeting. |
| Samsung |  | Both are workable. Just thinking adding a new IE is cleaner. |

## Capturing SIB19

**Question 4.2.1: Do the companies agree that the split CU/DU architecture is relevant to release 17, given that the payload are transparent ?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree/not agree** | **Comment** |
| Nokia | agree | Maybe RAN3 need to answer the question: is there any issue to use split CU/DU in NTN? Before this SIB issue, there is no known issue per our knowledge.  |
| Huawei | Tend to agree. See comments | I guess the agreement is “F1 and split CU/DU architecture is not precluded in R17”. Correspondingly, RAN3 include no enhancement to F1 interface in R17. In our understanding, ‘not preclude’ means there is a possibility that split CU/DU architecture is supported, especially considering transparent payloads are used in R17.  |
| Deutsche Telekom | Agree | The CU/DU split architecture doesn’t seem to be precluded for NTN. As Nokia mentioned, we may start discussion if any issue is against that.  |
| Ericsson | Disagree | Given that in Rel-17 both CU and DU sit on the ground (likely in the same physical site), it may not be necessary to impact F1 specs in this release for NTN, as that interface most likely won’t be exposed. |
| ZTE | Disagree | We share the view with Ericsson. In Rel-17, we have not agreed any agreement related to F1 so far. Prefer to leave this issue to Rel-18. |
| CMCC | Neutral | Just like HW said, it is indeed a controversial issue. RAN2 introduces the SIB19 containing satellite assistance information. It is obviously not to ignore the impact on F1 interface associated with the introduction of SIB19. However, we have no discussion on split architecture for NTN in Rel-17. We prefer to adding a note in specification clarifying that“the SIB 19 is generated in DU”. Remaining issues should be handled in online discussion. |
| CATT | Disagree | We acknowledged the issue on generating the SIB19. But the split architecture for NTN is not supported in Rel-17. Even for Rel-18, the split architecture is not considered in the WID. Which means we do not necessary to support transfer of SIB19 in F1 for NTN for now. |
| China Telecom | Disagree | Share the view with Ericsson. F1 should be out of scope of the NTN work in Rel-17. |
| Qualcomm | Agree to neutral | Nokia’s argument is reasonable. Of course the gNB is on the ground, and also the reasoning for an option 2 split in NTN seems marginal. Nevertheless fundamentally you could see the two aspects as orthogonal in rel-17, i.e. NTN architecture and split RAN. So in that sense the addition seems fine if not critical. |
| Samsung | Neutral |  |

**Moderator’s summary**

Whether the split CU/DU architecture is relevant to release 17 ?

Views: Agree (3), Disagree (4), neutral (3)

Moderator suggestion: split architecture for NTN is not precluded in Rel-17 but no impact on F1 is to be considered in Rel-17

**Question 4.2.2: If companies agree to previous question, which logical entity (DU or CU) encodes SIB19 ?**

|  |  |
| --- | --- |
| **Company** | **Comment** |
| Nokia | DU |
| Huawei | DU |
| Deutsche Telekom | DU |
| Ericsson | DU |
| ZTE | DU, if we finally agree the Q 4.2.1. |
| CMCC | DU |
| CATT | DU, if CU/DU split architecture is supported. |
| China Telecom | DU |
| Qualcomm | DU |
| Samsung | DU |

**Moderator’s summary**

To the question, which logical entity (DU or CU) encodes SIB19 ?

Views: all responded DU

Moderator suggestion: All companies agree that SIB 19 is encoded by the DU

**Question 4.2.3: Do the companies agree that the SIB19 information needs to be signaled to the CU from the DU ?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree/not agree** | **Comment** |
| Nokia | agree |  |
| Huawei | Agree if we agree question 4.2.1 |  |
| Deutsche Telekom | Agree |  |
| Ericsson | Disagree | Even if we agree to q. 4.2.1, the CU does not seem to need this information for any specific action. Therefore, it should not be signaled over F1. |
| ZTE | Agree | Yes, if we finally agree the Q 4.2.1. |
| CMCC | Neutral |  |
| CATT | Pending to | Pending to the answer of Q4.2.1. |
| China Telecom | Disagree |  |
| Qualcomm | Agree | Depending on 4.2.1 |
| Samsung | Agree if we agree question 4.2.1 |  |

**Moderator’s summary**

To the question, whether the SIB19 information needs to be signaled to the CU from the DU ?

Views: Agree (7) if agree in Q 4.2.1 , Disagree (2), Neutral (1)

Moderator suggestion: No impact on F1 to be considered for this

**Question 4.2.4: Do companies agree to add a note clarifying that “the SIB 19 is generated in DU” ?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree/not agree** | **Comment** |
| Nokia | agree |  |
| Huawei | agree |  |
| Deutsche Telekom | Agree |  |
| Ericsson | Agree |  |
| ZTE | Agree | Yes, if we finally agree the Q 4.2.1. |
| CMCC | Agree |  |
| CATT | Agree | Also pending to the answer of the Q4.2.1. |
| China Telecom | Neutral |  |
| Qualcomm | Agree |  |
| Samsung | Agree |  |

**Moderator’s summary**

To the question, whether companies agree to add a note clarifying that “the SIB 19 is generated in DU” ?

Views: Agree (9), Neutral (1)

Moderator suggestion: All companies agree to capture a note clarifying that “the SIB 19 is generated in DU”

**Question 4.2.5: If companies agree to previous question, where such note should be added ? (e.g. in chairs note, in 38.401 or in 38.470 or else)**

|  |  |
| --- | --- |
| **Company** | **Comment** |
| Nokia | 38.470 |
| Huawei | 38.470 |
| Deutsche Telekom | 38.470 |
| Ericsson | 38.470 or Chair’s notes |
| ZTE | 38.470 |
| CMCC | 38.470 |
| CATT | 38.470 or Chair’s notes |
| CMCC | 38.470 |
| Qualcomm | 38.470 |
| Samsung | 38.470 or Chair’s notes |

**Moderator’s summary**

To the question, in which document (**in 38.401 or in 38.470 or else**) a note clarifying that “the SIB 19 is generated in DU” should be added ?

Views: in 38.470 (8)

Moderator suggestion: All companies agree to capture a note in TS 38.470clarifying that “the SIB 19 is generated in DU” => See revised CR 38.470 in R3-223872

## Mapped cell Id handling

Based on the 1st round discussion, the below Text for 38.300 is proposed

“*The Cell Identities used in the RAN Paging Area during Xn RAN paging allow the identification of the correct target cells for RAN paging.*

*NOTE 1: The Cell Identity used for RAN Paging is assumed to typically represent a Uu Cell ID.*

*The mapping between Mapped Cell IDs and geographical areas is configured in the RAN and Core Network.*

*NOTE 2: A specific geographical location may be mapped to multiple Mapped Cell ID(s), and such Mapped Cell IDs may be configured to indicate differerent geographical areas (e.g. overlapping and/or with different dimensions).*

*The gNB is responsible for constructing the Mapped Cell ID based on the UE location info received from the UE, if available. The mapping may be pre-configured (e.g., up to operator's policy) or up to implementation.*

*NOTE 3: As described in TS 23.501 [3], the User Location Information may enable the AMF to determine whether the UE is allowed to operate at its present location. Special Mapped Cell IDs may be used to indicate areas outside the serving PLMN's country.*”

**Question 4.3: Do companies agree with the above text change for clause 16.14.5 “NG-RAN signaling” in TS 38.300 ?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree/not agree** | **Comment** |
| Thales | Agree |  |
| Nokia | Agree with small comment | 2 small changes above, i.e. one sentence should be marked as new text, use Mapped Cell ID which is already defined in Section 3.2. I uploaded a draft CR. |
| Huawei | Agree | Also fine with Nokia’s comment |
| Deutsche Telekom | Agree | Fine with Nokia’s update draft CR |
| Ericsson | Agree |  |
| ZTE | Agree | Fine with Nokia’s update draft CR. |
| CMCC | Agree |  |
| CATT | Agree, but | As been proposed in 3272, the Cell Identity used in some of the cases is not necessarily to be the mapped Cell ID, e.g. in ULI during Initial access.Thus, we propose to consider the addition of “may”in 3272..The Cell Identity, as defined in TS 38.413 [26] and TS 38.423 [50], used in following cases may corresponds to a Mapped Cell ID, irrespective of the orbit of the NTN payload or the types of service links supported.- The Cell Identity indicated by the gNB to the Core Network as part of the User Location Information;- The Cell Identity used for Paging Optimization in NG interface;- The Cell Identity used for Area of Interest;- The Cell Identity used for PWS. |
| China Telecom | Agree |  |
| Qualcomm | Agree |  |
| Samsung | Agree |  |

**Moderator’s summary**

All companies seem to agree on the proposed CR 38.300 (reflected in R3-223858) with further revisions suggested by Nokia and CATT

Moderator suggestion: to submit this CR 38.300 for approval on line

But without the “may” suggested by CATT since as Nokia indicated, adding the “may” cause the confusion to CN, and add complexity in both RAN and CN to handle the received cell ID (i.e. some are Uu cell ID and some are Mapped cell ID).

# 3rd round discussion

## PLMN information in ULI

**Proposal 5.1: Companies are invited to check the CR 38.413 in [R3-223099] and provide their comments in bubbles in the document uploaded in the server at phase 3 of CB#NRNTN discussion**

## Mapped Cell Id

CATT suggests to add “may” in a sentence of clause 16.14.5 “NG-RAN signaling” of TS 38.300 as follow:

“The Cell Identity, as defined in TS 38.413 [26] and TS 38.423 [50], used in following cases may corresponds to a Mapped Cell ID, irrespective of the orbit of the NTN payload or the types of service links supported.”

**Question 5.2.1: What is the problem that we are trying to solve with the introduction of this “may”?**

|  |  |
| --- | --- |
| **Company** | **Comment** |
| Qualcomm | So we understand (and had considered previously when doing analysis of impact of no location at the last meeting) the justifying use case which is:Fixed cell + no location information.We would like to point that even in case of quasi-fixed cells, the Uu cell ID may well change even if the coverage is more or less static.But taking a general view, this seems more like a discussion of semantics or meanings.If we interpret mapping as x-> y where y is always different from x, and also there can be no values of y that can be values of x, and also no values of y can be equivalent to values of x, then we have one view.But more generally “mapping” is basically a function that translates whatever knowledge of the UE location into a cell which is known to the CN. If in the extreme case the only knowledge is the Uu cell, and there is mapped cell ID in the CN DB whose area is equivalent, that is a mapping. Even if the values of ID are the same, this can be seen as a rather special case of mapping. The point is that mapped cells are always part of the CN DB, and not sometimes. Importantly, the CN should not need to know whether the values are the same or not.So overall we can see the concern, but don’t see a need to generate an exception in text. However even then, a generic “may” seems a little dangerous. |
| Nokia | It was questioned whether the gNB has a “mapped cell ID” to use before AS security is activated. We think this is not a problem. Before AS security is activated, the gNB may use a configured mapped cell ID, e.g. corresponds to the whole serving area of the gNB. Then the gNB provide a “better” Mapped Cell ID when UE location info is available.  |

**Question 5.2.2: Do companies agree with the suggestion from CATT ?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree/not agree** | **Comment** |
| Qualcomm | Not agree | Fully understand the motivation, but we either do nothing, or perhaps we need to think more how to express the exceptions for this type of use case (next meeting?). But for sure just switching to “may” seems too generic.  |
| Nokia | Not agree | As explained above, the gNB can use mapped cell ID in ULI before AS security. In addition, the “may” is at least not applicable to other bullets, e.g. - The Cell Identity used for Paging Optimization in NG interface;- The Cell Identity used for Area of Interest;- The Cell Identity used for PWS. |

***END***