**3GPP TSG RAN WG3 Meeting # 115-e R3-22xxxx**

**e-meeting, 21st February – 3rd March 2022**

**Title: CB: # 2001\_NTN\_General (summary of 1st round)**

**Source: Thales (moderator)**

**Type: discussion**

**Document for: Agreement**

**Agenda Item: 20.1**

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

# Introduction

This document aims at discussing and agree on BL 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: # 2001\_NTN\_General**

**- Endorse BL CRs if agreeable**

**- Check LSs from other groups and provide reply LS if needed**

**- CHO discussions:**

**- Should time-based triggered CHO be supported in RAN3?**

**- if yes, Should CHO time window and estimated serving cell stop time?**

**- Is it acceptable that no UE location information is reported during initial access?**

**- In light of discussions on location reporting, should the content of the BLCRs be modified (e.g. for TS38.300)?**

(Thales - moderator)

Summary of offline disc

The following TDOCs are considered as part of this discussion:

|  |  |  |
| --- | --- | --- |
| [R3-221508](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_115-e%5CDocs%5CR3-221508.zip) | Clarification of NAS Node Selection Function for NTN nodes providing access over multiple countries (Qualcomm Incorporated, Nokia, Nokia Shanghai Bell, Huawei, Thales) | CR0029r7, TS 38.410 v16.4.0, Rel-17, Cat. C |
| [R3-221509](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_115-e%5CDocs%5CR3-221509.zip) | Introduction of NTN (Qualcomm Incorporated, Huawei, Thales, , Ericsson, Nokia, Nokia Shanghai Bell, CATT) | CR0488r8, TS 38.423 v16.8.0, Rel-17, Cat. B |
| [R3-221524](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_115-e%5CDocs%5CR3-221524.zip) | Introduction of NTN (Qualcomm Incorporated, Huawei, Thales, , Ericsson, Nokia, Nokia Shanghai Bell, CATT) | CR0490r9, TS 38.413 v16.8.0, Rel-17, Cat. B |
| [R3-221609](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_115-e%5CDocs%5CR3-221609.zip) | Support Non-Terrestrial Networks (Huawei, Thales, Ericsson, ZTE, Qualcomm Incorporated) | draftCR |
| [R3-221662](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_115-e%5CDocs%5CR3-221662.zip) | Reply LS on NTN specific User Consent (RAN2) | LS in |
| [R3-221742](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_115-e%5CDocs%5CR3-221742.zip) | (TP for TS 38.300 BL CR on NTN) Discussion of the RAN2 LS on absence of UE location information at RRC Setup (Qualcomm Incorporated) | other |
| [R3-221743](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_115-e%5CDocs%5CR3-221743.zip) | (TP for TS38.413 BL CR on NTN) LS Response Analysis: Handling TA reporting in ULI (Qualcomm Incorporated) | other |
| [R3-221786](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_115-e%5CDocs%5CR3-221786.zip) | UE Location Information and NTN (Ericsson LM) | discussion |
| [R3-221787](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_115-e%5CDocs%5CR3-221787.zip) | [DRAFT] Reply LS on UE location during initial access in NTN (Ericsson LM) | LS out To: RAN2, SA2 CC: SA2, CT1, SA3 |
| [R3-221921](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_115-e%5CDocs%5CR3-221921.zip) | UE location report during initial access (Huawei) | other |
| [R3-221922](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_115-e%5CDocs%5CR3-221922.zip) | [DRAFT] Relpy LS on UE location during initial access in NTN (Huawei) | LS out To: RAN2,SA2 CC: SA3,CT1 |
| [R3-221770](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_115-e%5CDocs%5CR3-221770.zip) | LS response on UE location during initial access in NTN (THALES) | LS out To: RAN2 CC: SA3, SA2Move to 20.1 |
| [R3-221797](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_115-e%5CDocs%5CR3-221797.zip) | CHO for NTN - Possible RAN3 Impacts of Ongoing RAN2 Discussion (Ericsson LM, Thales) | discussion |
| [R3-221675](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_115-e%5CDocs%5CR3-221675.zip) | LS on UE location during initial access in NTN (RAN2) | LS inwithdrawn |
| *R3-221357* | *LS on UE location during initial access in NTN (RAN2)* | *LS in**Submitted at the RAN3#114bis-e meeting: (R2-2201881)* |

The following documents can be noted

* R3-221797 “CHO for NTN - Possible RAN3 Impacts of Ongoing RAN2 Discussion” (Ericsson LM, Thales): since it is for information and RAN3 shall wait for RAN2 decision on the matter
* R3-221662 “Reply LS on NTN specific User Consent” (RAN2)

# For the Chairman’s Notes

Propose the following:

Propose to capture the following:

**The document R3-221797 “CHO for NTN - Possible RAN3 Impacts of Ongoing RAN2 Discussion” (Ericsson LM, Thales) is noted. RAN2 decision on the matter is needed before discussion can take place.**

**The document R3-221662 “Reply LS on NTN specific User Consent” (RAN2)**

# 1st round discussion

## BL CR to TS 38.300

The two below TDOCs: latest version BL CR for TS 38.300 as outcome of RAN3#114-bis-e and a text proposal:

|  |  |  |
| --- | --- | --- |
| [R3-221609](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_115-e%5CDocs%5CR3-221609.zip) | Support Non-Terrestrial Networks (Huawei, Thales, Ericsson, ZTE, Qualcomm Incorporated) | draftCR |

**Question 3.1.1: Is the draft BL CR 38.300 in [R3-221609] agreeable ?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree/not agree** | **Comment** |
| Thales | Agree |  |
|  |  |  |

**Moderator’s summary:**

-

## BL CR to TS 38.410

The TDOC below, includes latest version BL CR for TS 38.410 as outcome of RAN3#114-bis-e.

|  |  |  |
| --- | --- | --- |
| [R3-221508](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_115-e%5CDocs%5CR3-221508.zip) | Clarification of NAS Node Selection Function for NTN nodes providing access over multiple countries (Qualcomm Incorporated, Nokia, Nokia Shanghai Bell, Huawei, Thales) | CR0029r7, TS 38.410 v16.4.0, Rel-17, Cat. C |

**Question 3.2: Is the draft BL CR 38.410 in [R3-221508] agreeable ?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree/not agree** | **Comment** |
| Thales | Agree |  |
|  |  |  |

**Moderator’s summary:**

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## BL CR to TS 38.413

The two below TDOCs: latest version BL CR for TS 38.300 as outcome of RAN3#114-bis-e and a text proposal:

|  |  |  |
| --- | --- | --- |
| [R3-221524](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_115-e%5CDocs%5CR3-221524.zip) | Introduction of NTN (Qualcomm Incorporated, Huawei, Thales, , Ericsson, Nokia, Nokia Shanghai Bell, CATT) | CR0490r9, TS 38.413 v16.8.0, Rel-17, Cat. B |
| [R3-221743](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_115-e%5CDocs%5CR3-221743.zip) | (TP for TS38.413 BL CR on NTN) LS Response Analysis: Handling TA reporting in ULI (Qualcomm Incorporated) | other |

**Question 3.3.1: Is the draft BL CR 38.413 in [R3-221524] agreeable ?**

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| --- | --- | --- |
| **Company** | **Agree/not agree** | **Comment** |
| Thales | Agree |  |
|  |  |  |

In [R3-221743] it is stated that:

* Observation 1: The agreed TP in [2], while reusing the legacy IE, is not optimal when interworking with both legacy and upgraded AMFs and does not align with TS38.300.
* Observation 2: In general, a better fit to the requirements and also stage 2 is provided by the structures that do not use the legacy *TAI* IE.
* Observation 3: If necessary, it is possible to define an alternative signalling structure which reuses the legacy *TAI* IE, while being fully compatible with stage 2.
* Proposal 1: RAN3 to consider the Text Proposal in the Annex for the support of the functionality agreed in SA2.

**Question 3.3.2: Is the Text Proposal for the draft BL CR 38.413 in [R3-221743] agreeable ?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree/not agree** | **Comment** |
| Thales | Agree |  |
|  |  |  |

**Moderator’s summary:**

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## BL CR to TS 38.423

The TDOC below includes latest version BL CR for TS 38.423 as outcome of RAN3#114-bis-e:

|  |  |  |
| --- | --- | --- |
| [R3-221509](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_115-e%5CDocs%5CR3-221509.zip) | Introduction of NTN (Qualcomm Incorporated, Huawei, Thales, , Ericsson, Nokia, Nokia Shanghai Bell, CATT) | CR0488r8, TS 38.423 v16.8.0, Rel-17, Cat. B |

**Question 3.4: Is the draft BL CR 38.423 in [R3-221509] agreeable ?**

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| --- | --- | --- |
| **Company** | **Agree/not agree** | **Comment** |
| Thales | Agree |  |

**Moderator’s summary:**

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## UE location reporting during initial access

The below TDOCs relates to the same topic:

|  |  |  |
| --- | --- | --- |
| *R3-221357* | *LS on UE location during initial access in NTN (RAN2)* | *LS in**Submitted at the RAN3#114bis-e meeting: (R2-2201881)* |
| [R3-221786](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_115-e%5CDocs%5CR3-221786.zip) | UE Location Information and NTN (Ericsson LM) | discussion |
| [R3-221787](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_115-e%5CDocs%5CR3-221787.zip) | [DRAFT] Reply LS on UE location during initial access in NTN (Ericsson LM) | LS out To: RAN2, SA2 CC: SA2, CT1, SA3 |
| [R3-221921](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_115-e%5CDocs%5CR3-221921.zip) | UE location report during initial access (Huawei) | other |
| [R3-221922](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_115-e%5CDocs%5CR3-221922.zip) | [DRAFT] Relpy LS on UE location during initial access in NTN (Huawei) | LS out To: RAN2,SA2 CC: SA3,CT1 |
| [R3-221770](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_115-e%5CDocs%5CR3-221770.zip) | LS response on UE location during initial access in NTN (THALES) | LS out To: RAN2 CC: SA3, SA2Move to 20.1 |
| [R3-221797](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_115-e%5CDocs%5CR3-221797.zip) | CHO for NTN - Possible RAN3 Impacts of Ongoing RAN2 Discussion (Ericsson LM, Thales) | discussion |
| [R3-221742](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_115-e%5CDocs%5CR3-221742.zip) | (TP for TS 38.300 BL CR on NTN) Discussion of the RAN2 LS on absence of UE location information at RRC Setup (Qualcomm Incorporated) | other |

|  |  |  |
| --- | --- | --- |
| *R3-221357* | *LS on UE location during initial access in NTN (RAN2)* | *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.* |
| [R3-221786](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_115-e%5CDocs%5CR3-221786.zip) | UE Location Information and NTN (Ericsson LM) | Observation 1: The UE-provided location is not the only piece of information used to drive NNSF, so the gNB should be able to select the appropriate AMF in most cases.Observation 2: If we limit ourselves to serving cell information, AMF selection will be more accurate for smaller cell sizes.Observation 3: In NTN scenarios, if very large cells are deployed, there might be cases (e.g. close to country borders, presence of significant overlap between adjacent cells) where AMF selection may not be unique based on the same serving cell information.Observation 4: Wrong AMF selection will lead to a dropped connection, but the gNB can understand the reason and select the appropriate AMF, refining its selection criteria; the risk for a dropped connection is present only for the first UE and significantly decreases over time as other UEs are served from the same location.Proposal 1: For the reasons above, the lack of location information at UE network attach is acceptable.Proposal 2: Reply to RAN2 and SA2 according to the above; agree the reply LS [see R3-221787]. |
| [R3-221787](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_115-e%5CDocs%5CR3-221787.zip) | [DRAFT] Reply LS on UE location during initial access in NTN (Ericsson LM) | RAN3 would like to thank RAN2 about the status update on UE location reporting during initial access, and would like to provide the following information.The location information provided by the UE is used by the NG-RAN node, together with other information, as input for the NNSF for selecting the appropriate AMF at UE attach (Sec. 5.7 of TS 38.410 and the endorsed BL CR, R3-220010). However, UE location is not the only information used by NNSF, so in its absence the gNB should still be able to select the appropriate AMF in most cases. RAN3 confirms RAN2’s understanding that the NG-RAN can reselect an AMF serving a PLMN corresponding to the available UE's current location, determined by other means (including e.g. looking at the serving cell for the UE).In conclusion, the absence of UE location information at network attach seems acceptable. This might lead to incorrect AMF selection in rare cases, but if this happens the NG-RAN will be able to reselect the correct AMF for the same UE. |
| [R3-221921](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_115-e%5CDocs%5CR3-221921.zip) | UE location report during initial access (Huawei) | Proposal 1: It's acceptable that no UE location information is reported during initial access.Proposal 2: The relevant stage2 content in 38.300 should be modified as follow:*The gNB is responsible for constructing the Mapped Cell ID based on the UE location info received from the UE, if available.* |
| [R3-221922](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_115-e%5CDocs%5CR3-221922.zip) | [DRAFT] Relpy LS on UE location during initial access in NTN (Huawei) | RAN3 thanks to RAN2 for the LS on UE location during initial access in NTN. RAN3’s view regarding the questions is as follows:RAN3 thinks no coarse location report at initial access may increase the probability of selecting incorrect AMF, which anyway can be refined after the activation of AS security. Thus, it's acceptable for RAN3 that no UE location information is reported at the NG-RAN in a NTN network during initial access. |
| [R3-221770](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_115-e%5CDocs%5CR3-221770.zip) | LS response on UE location during initial access in NTN (THALES) | RAN3 thanks RAN2 for its liaison statement and take note that 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.
* and therefore asks whether it's acceptable that no UE location information is reported at the NG-RAN in a NTN network during initial access.

RAN3 would like to recall its agreements reflected in its stg2 BL CR (see R3-221609)The mapping between Cell Identities and geographical areas is configured in the RAN and Core Network. “*The gNB is responsible for constructing the Mapped Cell ID based on the UE location info received from the UE. The mapping may be pre-configured (e.g., up to operator’s policy) or up to implementation.**NOTE: 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. Pre-configuration of special mapped cell identifiers may be used to indicate areas outside the serving PLMN’s country.**The gNB reports the broadcasted TAC(s) of the selected PLMN to the AMF as part of ULI. In case the gNB knows the UE’s location information, the gNB may determine the TAI the UE is currently located in and provide that TAI to the AMF as part of ULI*.”On the basis of the above, the gNB will not be able to determine during the initial access, the Mapped Cell ID and the TAI in which the UE is located, hence enabling the AMF to determine whether the UE is allowed to operate at its present location. |
| [R3-221742](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_115-e%5CDocs%5CR3-221742.zip) | (TP for TS 38.300 BL CR on NTN) Discussion of the RAN2 LS on absence of UE location information at RRC Setup (Qualcomm Incorporated) | Proposal 1: Current baseline text in TS 38.410 does not need to be changed.Proposal 2: Add a note in TS 38.300 to reflect the fact that the Mapped Cell ID may have differing granularities, as a consequence of the potential lack of UE location information and agree the TP in this document.Proposal 3: No other changes are needed in stage 2 as a result of not obtaining the UE location before AS security is set up.Proposal 4: RAN3 responds to RAN2 stating: “RAN3 understands from previous correspondence with SA2 that, at initial access, it is unnecessary for the geographic area represented by the CGI to be comparable to a TN cell coverage area as long this can be supported in a ULI provided subsequently. In addition, there are no significant impacts in RAN3 specifications”. |

**Question 3.5.1: What impact “no coarse location report at initial access” may have on NG-RAN ?**

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| --- | --- |
| **Company** | **Comment** |
| Thales | the gNB will not be able to determine during the initial access, the Mapped Cell ID and the TAI in which the UE is located, hence enabling the AMF to determine whether the UE is allowed to operate at its present location. |
|  |  |

**Question 3.5.2: Is “no coarse location reported during initial access” acceptable from RAN3 point of view and why ?**

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| --- | --- | --- |
| **Company** | **Yes/No** | **Comment** |
| Thales | No | This may have impact the call set-up delay in case of large radio cells possibly covering multiple countries and therefore not acceptable especially for emergency call where safety of life is at stake.Therefore a solution at RAN level is needed enabling NG-RAN to determine in which country the UE is located in order to select the appropriate AMF to prevent unacceptable delay for the connection set-up especially for NTN with large radio cells that may cover several countries (see observation 1 of R2-220235) |
|  |  |  |

**Question 3.5.3: - In light of discussions on location reporting, should the content of the BLCRs be modified (e.g. for TS38.300 etc.) ? and if yes how ?**

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| --- | --- | --- |
| **Company** | **Yes/No** | **Comment** |
| Thales | No |  |

**Question 3.5.4: Does companies agree to respond to the incoming LS in [R3-221357]. If yes what main message should be conveyed ?**

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| --- | --- | --- |
| **Company** | **Yes/No** | **Comment** |
| Thales | Yes | the gNB will not be able to determine during the initial access, the Mapped Cell ID and the TAI in which the UE is located, hence enabling the AMF to determine whether the UE is allowed to operate at its present location. |
|  |  |  |

**Moderator’s summary:**

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# 2nd round discussion

***END***