3GPP TSG-RAN WG3 #113-e R3-214364 (was R3-214209)

**E-meeting, 16th – 26th August 2021**

Source: CATT (moderator)

Title: CB: # 2006\_NTN\_Country\_Routing

Agenda Item: 20.2.5

Document for: Approval

# Introduction

**CB: # 2006\_NTN\_Country\_Routing**

**- Is any enhancemement needed for country specific routing?**

**- Is there convergence on any standardized solution?**

(CATT - moderator)

Summary of offline disc in [R3-214209](file:///C%3A%5CUsers%5Csunjiancheng%5CAppData%5CLocal%5CMicrosoft%5CWindows%5CTemporary%20Internet%20Files%5CContent.Outlook%5CMJUX9AOA%5CInbox%5CR3-214209.zip)

# For the Chairman’s Notes

**Agreement:**

1. TP R3-213539 is agreed.
2. Agree that:

The UE location information reported from the UE is accurate enough for AMF (re-)selection.

(no specification work is needed)

**Way Forward:**

Continue to discuss whether and how to address the use case “UE moves across the country (within the same cell) and not support the new PLMN of the country” in the next meeting.

# Discussion (1st round)

## Intra-gNB inter-AMF handover

Last meeting one WA is achieved that the RAN UE NGAP ID should be possible to be included in the source-to-target container in order to facilitate the target gNB to retrieve locally the UE’s context. In this meeting some companies propose to turn it into an agreement [2][4].

**Questions 1**: Do you agree to introduce the RAN UE NGAP ID into the source-to-target container, i.e. turning the WA achieved last meeting into agreement?

| Company | Comment |
| --- | --- |
| Thales | Ok |
| Ericsson | confirming the Working Assumption from last meeting is fine. |
| Qualcomm | Agree |
| Nokia | Agree |
| China Telecom | Agree |
| Huawei | Agree |
| CATT | Agree |
| Samsung | Agree |
| CMCC | Agree |
| ZTE | Agree |
| Vodafone | agree |

**Moderator’s summary:** 11 companies provided feedback, all agreed.

**Proposal: It’s proposed to agree with the TP in [2].**

## Confirm on the network behaviour regarding inter-country mobility

In addition, one company propose to confirm the following network behaviours [1]:

**Proposal 1: In initial access, the network should stop the UE from accessing to a non-****indigenous network.**

**Proposal 2: The network can utilize the existing positioning techniques for acquiring when the UE will cross the border, the details of how to initiate positioning is a matter of implementation.**

**Proposal 3: When UE moves across the country border and does not support the new PLMN, the UE should be handover to a candidate cell which has a local PLMN. Otherwise, the UE should be released.**

**Questions 2**: Do you agree to confirm the three proposals as above?

| Company | Comment |
| --- | --- |
| Thales | P1: AgreeP2: Agree, but this assumes that the network has knowledge of country borders and therefore, it should be clarified explicitly in the specP3: Proposal is unclear. |
| Ericsson | We are not sure what the RAN3 specification impact for the discussion in [1] will be. We don’t see any. Could we reduce the discussion to actual proposals on stage 2/3? Otherwise we are not able to provide comments. |
| Qualcomm | As a comment, at this point papers should have TPs with actual changes based on a critique of the current agreements or text, and not discuss topics as if they were new. Otherwise the work items would never end. P1 is not new, there are already various tools for this including in SA2, so nothing to agree. P2 (how RAN detects border crossing) is something we asked RAN2 in last meeting’s LS so it is strange to have this proposal. Wait for RAN2. P3 seems to be saying that the RAN should initiate at least an inter-AMF handover. I would refer the proponent to section 16.x.6 of the current BL CR for 38.300, perhaps there should be a TP stating what is missing. Note P3 seems the other way round. |
| Nokia | What is the impact to RAN3? P1: is this in RAN2 or SA2 scope? P2: what is “network” in this case? gNB or CN? RAN3 assumed gNB know the UE’s location information? If it is gNB ask UE to provide the UE location info, it is RAN2 issue on when initiate the position. P3: how is it different to terrestrial network?  |
| China Telecom | We are also not sure what the impact to RAN3, whether need to modify the stage2 text? |
| Huawei | We agree leave P1 and P2 to RAN2. P3 is proposed for complementary case of our current agreement. What we already have is if the UE support PLMN of both countries, we can initiate a NG-based HO to select the correct AMF. We have not discussed what if the UE moves across the country, and not support the new PLMN. So we see it is necessary to include this.  |
| CATT | P1: It is ok in principle, but it should be the UE’s responsibility not to do this (i.e. to select a PLMN that does not suit the UE’s own position). So from the perspective of network we don’t need to do anything on specs.P2: Surely the network can do this if it can, but maybe it is not an issue purely on implementation.P3: After reading [1] we think the intention is correct. It seems to mean that we may need the following change on TS 38.300 such as:- If the NG-RAN node detects that the UE is in a different country to that served by the serving AMF, the NG-RAN should perform an NG handover to change to an appropriate AMF or release the UE. |
| Samsung | Share the same view as Qualcomm |
| CMCC | P1: AgreeP2: It is up to decision from RAN2.P3: Same view with Huawei. |
| ZTE | P1 and P2 should be pending to RAN2, while for P3, CATT’s correction could be feasible. |
| Vodafone | P1: No. We need this capability in the system, but it’s use is a matter for configuration on the NG-RAN node, e.g. imagine using an AMF in country Y to provide service to UEs engaged in disaster relief in country X.P2: yes, but I don’t see any RAN 3 impact?P3: the NG-RAN can attempt the handover, but if the handover fails then release is fine. Normal network selection/idle mode mobility procedures can then occur – coupled with the NG-RAN’s NNSF routeing the UE to “an AMF in the UE’s country” |

**Moderator’s summary:**

11 companies provided feedback.

For P1 and P2 many companies prefer pending to RAN2 and Huawei themselves agreed, so the moderator suggests pending RAN2.

P3 is commented by many companies that it is not clear, while some companies acknowledged the use case and provide their understanding on how to address this use case. So the moderator suggests discussing whether and how to address the use case “UE moves across the country, and not support the new PLMN” in the next meeting.

**Moderator’s suggestion:**

To further discuss whether and how to address the use case “UE moves across the country, and not support the new PLMN” in the next meeting.

## Accuracy of the position information provided by the UE

Besides, one company show their understanding on the link between country-specific routing and the position information provided by the UE [3]:

**Proposal: Confirm that the location information reported from the UE is accurate enough for AMF (re-)selection. This does not preclude the gNB to verify this location information and drop the UE immediately if finding it fake.**

**Questions 3**: Do you agree to confirm the context shown in the proposal above?

| Company | Comment |
| --- | --- |
| Thales | AGREERAN2 agreed that UE provide a “UE coarse location information” during the initial access (UE coarse location information refers to coarse GNSS coordinates (FFS on the details, e.g. X MSB bits out of 24 bits of longitude/latitude or GNSS coordinates with ~2km accuracy)).This is sufficient for the AMF (re) selection as it is comparable with a typical TN cell granularity. However, this location needs to be network verified to comply with SA3-LI request in R3-211465 LS in Reply LS on UE location aspects in NTN. “*SA3LI notes that any method which relies solely on UE-generated location information is unlikely to be considered reliable for network selection purposes. Therefore, a method such as GNSS/A-GNSS cannot be considered as reliable or trusted unless the information provided by the UE can be verified by the network. In the event that the available location information is insufficient for the AMF to determine the UE location with comparable accuracy and reliability to terrestrial networks, SA3LI considers that invocation of LCS procedures via the LMF may be necessary to fulfil regulatory obligation.*“ |
| Ericsson | We are not sure what the RAN3 specification impact for the discussion in [1] will be. We don’t see any. Could we reduce the discussion to actual proposals on stage 2/3? Otherwise we are not able to provide comments. |
| Qualcomm | Yes but no impact. We are waiting for a reply LS but we already know RAN2’s current intention and it should be good for NNSF. Actually that is what we asked for in the LS we sent!! So we should be consistent with ourselves. The second part (issue about verifying location at the gNB, and what action to take) is more like RAN2/SA2. Note we have a paper proposing indication to the CN of whether ULI is verified but this is a different aspect. In addition, the CN can also verify (see already agreed SA2 text). Hence there seems to be nothing for RAN3 to agree here. |
| Nokia | Ok for the 1st part, but no impact to RAN3 spec. For the 2nd part “gNB to verify this location information”, how can gNB verify the location info? CN can perform a verification, and it is captured in SA2 spec. not sure at the impact to RAN3.  |
| China Telecom | Agree |
| Huawei | We agree the proposal  |
| CATT | Agree |
| Samsung | Not sure, maybe no impact to RAN3. |
| CMCC | The first part is fine, need to clarify how the location information is verified by gNB in the second part. We think there is still no conclusion. |
| ZTE | Similar concern with Nokia. |
| Vodafone | Agree with Qualcomm and Nokia |

**Moderator’s summary:**

11 companies provided feedback.

9 agreed with the first sentence, while 2 were not sure. Majority of the companies believed there’s no impact to the specification.

The second sentence is not acknowledged as we never discussed whether and how to verify the UE location info in the NG-RAN, thus we can forget this part.

**Moderator’s suggestion:**

The moderator suggests confirming the first sentence only, turn it to the agreement, and agree that there’s no specification impact in RAN3.

**Proposal: To agree that UE location information reported from the UE is accurate enough for AMF (re-)selection.**

# Conclusion, recommendations

Please see the section 2 for the final proposals.

# Reference

1. R3-213344; Country-specific routing issues; Huawei.
2. R3-213539; TP for BL CR for TS 38.413) Country Specific Routing for an RRC CONNECTED UE; Nokia, Nokia Shanghai Bell.
3. R3-213671; Discussion on country-specific CN selection; CATT.
4. R3-214087; Discussion on Country-specific Routing for NTN; ZTE.