**3GPP TSG-RAN WG2 Meeting #113 Electronic R2-210XXXX**

**25 January – 05 February 2021**

**Agenda item: 8.16.2**

**Source: Nokia**

**Title: Summary of [AT113-e][031][eNPN] LS out**

**WID/SID: NG\_RAN\_PRN\_enh-Core - Release 17**

**Document for: Decision**

# 1 Introduction

This document is the summary of the following email discussion:

**[AT113-e][031][eNPN] LS out (Nokia)**

Scope: LS out to SA2, cc: TBD. Take into account LS question agreements below for *SNPN with subscription or credentials by a separate entity*, and can consider additional filtering. Take into account LS question proposals for *UE onboarding and provisioning for NPN* and determine what shall be included, if any. Take into account LS question proposals *IMS voice and emergency services for SNPN* and determine what shall be included, if any.

Intended Outcome: Approved LS out

Deadline: Interactive discussion, stop when agreement is reached or at EOM. Companies are requested to comment ASAP.

## Contact person(s) for each participating company

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| --- | --- | --- |
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# 2 Discussion

**Q1: Is it acceptable to send the following question to SA2?**

Can RAN2 assume uniform support of external authentication related parameters (i.e., indicator for "access using credentials from a separate entity is supported", GID(s), and indicator for "whether the SNPN allows registration attempts from UEs that are not explicitly configured to select the SNPN") across a network or a registration area?

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| **Company** | **Answer** | **Comments**  |
| Huawei, HiSilicon | Yes with comments | We think the answer from SA2 has impact on cell selection/reselection. If the answer from SA2 is “No”, AS procedures will be much easier: after NAS selects an SNPN, AS could follow the legacy cell selection/reselection procedure.Apart from GID(s), other IEs related to external authentication should also be considered. Therefore we prefer to modify the question to:Can RAN2 assume uniform support of external authentication related parameters (i.e., indicator for support of external authentication, GID(s), and indicator for "whether the SNPN allows registration attempts from UEs that are not explicitly configured to select the SNPN") across a network or a registration area?Rapporteur: OK, this makes the question more specific (used some rewording, see changes in revision marks). |
| CATT | Yes, with comments | Agree with the intention, but some clarification is necessary1. This LS includes questions on several key issues,we should make it clear that this is about key issue 1# Enhancements to Support SNPN along with credentials owned by an entity separate from the SNPN
2. The current wording is vague, we understand the intention is to ask whether the supported GID list of a specific SNPN is same in any cell belongs to the SNPN.

So, we suggest a rewording as below,**For key issue#1 in SA2, Is the supported GID list of a specific SNPN same in any cell belongs to the SNPN?**Rapporteur: OK to clarify that this is for using credentials of separate entity, I hope that you can live with the wording based on Huawei proposal (see changes in revision marks). |
| OPPO | Yes | The answer of this question may have impact on AS cell reselection criteria, so better to clarify. |
| vivo | Yes | If the GIDs across a network or a registration area is not uniform support, there exists cell re-selection impact. |
| MediaTek | Yes | Useful to get a response from SA2 on this, to evaluate cell reselection impact |
| Intel | Yes |  |
| Ericsson | No | We can assume uniform support of GIDs because the following is captured in the conclusions of the SA2 TR as a first step for the UE:UE selects and attempts to register with the SNPN it was last registered with (if available). |
| Nokia | Yes |  |

**Summary:** 8 companies answered, and 1 one company does not support sending this question. Some revisions were proposed.

**Rapporteur's Proposal:** Send the revised version of the question to SA2.

**Q2: Is it acceptable to send the following question to SA2?**

Is the GID selected by NAS given to AS to assist UE subsequence cell selection and reselection?

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| **Company** | **Answer** | **Comments**  |
| Huawei, HiSilicon | Not urgent | It’s better to clarify whether GID is selected by NAS or AS.However, if the answer of Q1 is “Yes” (i.e. uniform support of GID across the network), then NAS only needs to select an SNPN and inform AS of the selected SNPN, and no need to give the selected GID to AS. |
| CATT | Yes, with comments | Agree to ask this question to SA2 as it is RAN2 agreement to ask.But Q1 seems sufficient. We should know whether there is impact on cell selection/reselection when we get answer to Q1 from SA2.Rapp: I agree that Q1 and Q2 are not independent, but I prefer keeping them. |
| OPPO | Yes | Both Q1 and Q2 should be included in the LS to SA2, because Q1 is to clarify the scenario of GID deployment and Q2 is the signaling impact. SA2 may get confused to only clarify a deployment issue without a clear intention. |
| vivo | Yes  | Q1 and Q2 has direct relationship. If the answer of Q1 is “No”, the selected GID by NAS need to be indicated to AS for cell selection.Otherwise, there is no need to indicated the selected GID by NAS to AS. |
| MediaTek | Yes |  |
| Intel | No | GID is only used to assist the UE NAS in initial network selection, however, once network selection is completed, it is the SNPN ID of the selected network (associated with that GID) that is provided to AS by NAS. We just need to ask Q1 first.  |
| Ericsson | No | The NAS layer only provides the SNPN ID. If this can be agreed, we do not need Q1. |
| Nokia | Yes | Q1 and Q2 are not independent, but it does not har sending it. |

**Summary:** 8 companies answered, and 2 companies do not support sending this question.

**Rapporteur's Proposal:** Not to send the question to SA2.

**Q3: Is it acceptable to send the following question to SA2?**

Should AS support the (IDLE/INACTIVE/CONNECTED mode) mobility scenarios between different SNPNs or SNPN and PLMN when the same credentials can be used on the source and the target networks?

E.g. Should the (IDLE/INACTIVE/CONNECTED mode) mobility of a UE be supported from SNPN#1 to SNPN#2 when the GID used to access SNPN#1 is supported by SNPN#2?
E.g. Should the (IDLE/INACTIVE/CONNECTED mode) mobility of a UE be supported between SNPN#1 and PLMN#a when the credential of PLMN#a is used to access SNPN#1?

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| **Company** | **Answer** | **Comments**  |
| Huawei, HiSilicon | Yes | Ok to clarify.Besides, we would also like to ask SA2 to clarify whether the general mobility across SNPNs is supported (without considering external authentication or onboarding).In R16, the mobility is restricted within an SNPN.We wonder in R17, if the UE has subscriptions with both SNPN1 and SNPN2, whether the mobility from SNPN1 to SNPN2 is supported. |
| CATT | Yes |  |
| OPPO | Yes with comments | Actually, RAN3 is the lead group for connected mode mobility issue, if companies are fine to ask from RAN2, we’re also fine. |
| vivo | Yes with comments | Mobility issue is in RAN3 scope. Actually, during RAN3#111e in Feb., RAN3 has discussed the support of mobility scenarios including service continuity between PLMN and SNPN. The final agreement is to wait for further input from SA2 w.r.t. whether RAN3 needs to support new mobility scenarios. We also prefer to wait for further progress of SA2. But we are ok if majority view supports to ask SA2.Rapp: As it has RAN2 impacts as well, I think RAN2 can ask it from SA2. |
| MediaTek | Yes |  |
| Intel | No | There is an ongoing LS exchange between SA2 and SA1 on requirements for service continuity (S2-2007828). Even though SA2 and SA1 are discussing service continuity, from RAN2 pov, we don’t think it will affect idle mode/inactive mobility as cell reselection is performed with a registered SNPN/PLMN or equivalent PLMN. Moving between 2 different SNPN or between SNPN and PLMN will require network selection. For connected mobility, it should be left to RAN3. |
| Ericsson | No | As mentioned by Intel, SA2 has already sent an LS to SA1 ([S2-2007828](http://www.3gpp.org/ftp/tsg_sa/WG2_Arch//TSGS2_139e_Electronic/Docs//S2-2007828.zip)). We can wait for the SA2 outcome. |
| Nokia | Yes |  |
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**Summary:** 8 companies answered, and 2 companies do not support sending this question.

**Rapporteur's Proposal:** Not to send the question to SA2.

**Q4: Is it acceptable to send the following question to SA2?**

Shall Group IDs be broadcasted per SNPN or per cell?

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| **Company** | **Answer** | **Comments**  |
| Huawei, HiSilicon | Yes | It will make RAN2 work easier. |
| CATT | Yes, with comments | Agree to ask this question to SA2 as it is RAN2 agreement to ask.But Q1 seems sufficient. We should know whether it is per SNPN or per cell once we get answer to Q1 from SA2.Rapp: this is an independent question from Q1. We need to get an answer from SA2 to be able to agree to proceed in RAN2. |
| OPPO | Yes | This question is helpful to understand the SA2 original intention by introducing GID, may impact cell selection/reselection rule, so better to clarify. |
| vivo | Yes | The answer of SA2 may have impacts on RAN2 work. |
| MediaTek | Yes, with comments | Suggest just having the question without the text in parenthesis. We expect SA2 understand well how GIDs are to be used.Rapp: I think the additional clarification in parenthesis is not harmful.MTK2: It’s obvious that we have different views on how GIDs are supposed to work (whether it is associated with SNPNs or not). We would therefore insist that the text in parenthesis is removed, to not muddy the waters further. Let’s ask a clear question from SA2, and I expect that they will clear the confusion between us with their response. |
| Intel | Yes | The TR is not very clear, but our understanding is that GID is broadcast per SNPN. |
| Ericsson | No | 16/16 companies think it should be per SNPN. So, we think that this can be resolved in RAN2 and we are not sure why we need to ask SA2 for further confirmation.Moreover, the NAS layer needs to know which SNPN supports the GID. In this regard, NAS does not have SNPN ID to GID mapping. Hence, without any clear association, the UE would not know which SNPN to select.See text in SA2 TR, clause 8.1.4:- UE configuration- User-controlled prioritized list of preferred SNPNs- Separate entity controlled prioritized list of preferred SNPNs- Separate entity-controlled prioritized list of Group IDs (GIDs)NOTE 3: The UE may also only be configured with the separate entity-controlled prioritized list of preferred SNPNs or only the separate entity-controlled prioritized list of Group IDs. |
| Nokia | Yes |  |

**Summary:** 8 companies answered, and 1 company does not support sending this question. One company insisting on shortening the question.

**Rapporteur's Proposal:** Send the revised version of the question to SA2.

**Q5: Is it acceptable to send the following question to SA2?**

**Can RAN2 assume** uniform support of onboarding in **all cells in an O-SNPN? (I.e. can RAN2 assume that all cells of an O-SNPN broadcasts the support for onboarding** **or can some cells not set the ”onboardingEnabled” bit to e.g. control RAN congestion?)**

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| **Company** | **Answer** | **Comments**  |
| Huawei, HiSilicon | Yes | Similar to Q1, the answer from SA2 has impact on cell selection (not reselection, because we think there’re no reselection scenarios for onboarding). If the answer from SA2 is “No”, AS procedures will be much easier: after NAS selects an SNPN, AS could follow the legacy cell selection procedure. |
| CATT | Yes | It is good to have clarification from SA2. |
| OPPO | Yes | The same view as Q1 |
| vivo | Yes | The answer of SA2 may have impacts on RAN2 work. |
| MediaTek | Yes |  |
| Intel | Yes |  |
| Ericsson | Not needed; but if sent, we should reformulate | Onboarding is a one-shot procedure. We can assume that once a suitable cell within the selected O-SNPN is found, the UE starts the onboarding procedure and is not moved to IDLE/INACTIVE. Thus, it is not relevant if another cell within the same SNPN has onboarding enabled or not.If RAN2 agrees on this question, it would be good to add some background information on this in the LS, e.g. that some companies in RAN2 would like to use the “onboardingEnabled” bit for congestion control, and then the information would not be uniform within the O-SNPN. Modified question proposal:**Can RAN2 assume** uniform support of onboarding in **all cells in an O-SNPN? (I.e. can RAN2 assume that all cells of an O-SNPN broadcasts the support for onboarding or can some cells not set the ”onboardingEnabled” bit to e.g. control RAN congestion?)** |
| Nokia | Yes |  |

**Summary:** 8 companies answered, and 1 company requested a revision.

**Rapporteur's Proposal:** Send the revised version of the question to SA2.

**Q6: Is it acceptable to send the following question to SA2?**

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| **Company** | **Answer** | **Comments**  |
| Huawei, HiSilicon | No | It’s in RAN3 scope, and we think it’s already clear in the TR. If there’re other purposes, SA2 will capture them.* Upon registration to an SNPN for Onboarding, the UE provides an indication at RRC level that the RRC connection is for onboarding. This information will be specified only for SNPN and allows NG-RAN to select an appropriate AMF that supports onboarding procedures.
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| CATT | No | SA2 conclusion on this seems very clear. At least so far the purpose is only for AMF selection.//23.757,8.4.1

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| Upon registration to an SNPN for Onboarding, the UE provides an indication at RRC level that the RRC connectionis for onboarding. This information will be specified only for SNPN and allows NG-RAN to select an appropriate AMF that supports onboarding procedures. |

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| OPPO | No | Agree Huawei and CATT |
| vivo | No | Agree HW Rapporteur: Due to concerns, it is proposed not to send this question. |
| MediaTek | Yes | Based on the SA2’s response RAN2 can make an informed decision on whether such an indication needs to be sent (or not) when resuming from Inactive mode. |
| Intel | No | It is already clear in the SA2 TR clearly states that it is for AMF selection, but also has the following NOTE: “RAN WGs can work with SA2 to decide whether handling of RAN-level congestion is feasible.”. In our understanding it is up to RAN 2 or 3 to decide whether the same indication can be used for RAN-level congestion e.g. as with RLOS. |
| Ericsson | No | SA2 indicated that the bit needs to be included on AS level. As discussed online, such a question should – if at all – be triggered by RAN3. |

**Summary:** 7 companies answered, and 6 companies do not support sending this question.

**Rapporteur's Proposal:** Not to send the question to SA2.

**Q7: Is it acceptable to send the following question to SA2?**

**Does SA2 see any need of UAC enhancements for onboarding? Can the onboarding indication in SIB** be toggled for access control purposes?

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| **Company** | **Answer** | **Comments**  |
| Huawei, HiSilicon | No | This issue can be decided in RAN2. SA2 is not responsible for the specific solution like toggling the indication in SIB. |
| CATT | Yes, with comments | **Whether gNB can perform the access control by** toggling **the onboarding indication in SIB** is dependent on answer to Q5.If the status of “onboarding indication” is SNPN specific, i.e. it should be same on any cell of a specific SNPN, then NG-RAN should not decide the the value of “**onboarding indication**” on its own. |
| OPPO | Yes with comments | We think asking CT1 is more suitable than SA2. |
| vivo | Yes | Agree that we also need to ask CT1. |
| MediaTek | Partly yes | We agree with the first question. Whether we use SIB toggling or not, is a RAN2 discussion.Rapp: This issue requires more discussion in RAN2. As CT1 has not started the work, and there are concerns of sending this question, rapporteur's proposal not to send this question at this point. |
| Intel | No | SA2 asks RAN2 to decide in the TR. |
| Ericsson | No | Agree with rapporteur. Furthermore, there is no SA1 requirement. So, we can assume UAC is not needed.It seems common understanding that UE onboarding is a one-shot procedure, and we can also assume that it is only done once in a UE lifetime. Therefore, a simple mechanism is sufficient. We do not see the need to add more complexity in terms of further SA1 specification and network configuration complexity. |
| Nokia | No |  |

**Summary:** 7 companies answered, and 3 companies do not support sending this question.

**Rapporteur's Proposal:** Not to send the question to SA2.

**Q8: Is it acceptable to send the following question to SA2?**

Can UE in SNPN AM initiate emergency services on any of the SNPNs supported by the cell under RAN sharing scenarios? (Note if the answer is "YES" then RAN2 assumption is that the emergency support indication in SIB can be per cell (common indicator for all SNPNs that share the cell). If the answer is "NO" then RAN2 assumption is that the emergency support indication in SIB should be per SNPN.

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| **Company** | **Answer** | **Comments**  |
| Huawei, HiSilicon | Yes | It will make RAN2 work easier. |
| CATT | Yes, with comments | It needs confirmation with SA2.But maybe SA2 have no idea how to answer this question if they cannot understand the intention behind this question.We understand the intention is to clarify whether UE in SNPN AM can initiate emergency services on any of the SNPNs supported by the cell under RAN sharing scenarios.1. If UE in SNPN AM can initiate emergency services on any of the SNPNs supported by the cell, then “emergency support indication” for SNPN in SIB1 can be per cell, similar as the legacy IE.
2. If UE in SNPN AM can initiate emergency services on a specific SNPN among the SNPNs supported by the cell, then “emergency support indication” for SNPN in SIB1 should be per SNPN.

So, we suggest a rewording as below,**Can UE in SNPN AM initiate emergency services on any of the SNPNs supported by the cell under RAN sharing scenarios?**Rapporteur: Agree with the comment, see rewording proposal with track changes above. |
| OPPO | Yes | The requirements are from SA2, so it’s suitable to ask SA2 for clarification. |
| vivo | Yes with comments | In SA2 TR, the requirement of emergency support indicator for SNPN is as below:* Include related broadcast indicator that the cell supports Emergency Services over NG-RAN for UEs in limited service state, and if the NG-RAN is shared by more than one network, and the networks do not have the same support for Emergency Services, the broadcast indicator is related to those networks that supports Emergency Services.

It is not clear that whether SA2 prefer cell specific indicator or network specific indicator. Theoretically, SA2 will specify the granularity of emergency support indicator clearly if they have any preference. However, SA2 does not. In addition, Signaling design of emergency support indicator is in RAN2 scope. We think RAN2 can make decision. Anyway, we prefer not to ask SA2 as they may cannot provide constructive answer for our question.But we are also fine if majority view supports to ask. |
| MediaTek | Yes |  |
| Intel | ??? If we do, then we should copy CT1 (See comments) | It can be decided by RAN based on IMS emergency support for PLMN in LTE and NR in limited service state. Like the existing IMS emergency support indicator (since LTE Rel-9), it is sufficient to have just one bit to indicate support for the ims-EmergencySupport indicator for SNPN in a cell. We don’t think the situation for SNPN regarding emergency calls in limited service state is different from what it was for PLMNs in LTE Rel-9. It is only indicating whether a SNPN cell supports IMS emergency bearer services for UEs in limited service mode, as long as one network within the cell support IMS emergency service in limited service state. If we make it per SNPN, it may have impact to CT1 where the current trial and error behaviour of selecting a network for emergency calls for PLMN may have to change for SNPN. Hence RAN2 should also copy CT1 so that they are informed if SA2 decide that it should be per SNPN.  |
| Ericsson | No | The conclusion in the SA2 TR refers to Solution#23, which states that the indicator is for those SNPNs supporting emergency services in a network sharing scenario, see clause 6.23.4:“Include related broadcast indicator that the cell supports Emergency Services over NG-RAN for UEs in limited service state, and if the NG-RAN is shared by more than one network, and the networks do not have the same support for Emergency Services, the broadcast indicator is related to those networks that supports Emergency Services.” |
| Nokia | Yes |  |

**Summary:** 8 companies answered, and 1 company does not support sending this question as this has already clarified in SA2 TR. Some revisions were proposed.

**Rapporteur's Proposal:** Send the revised version of the question to SA2.

**Q9: Is it acceptable to send the following question to SA2?**

Is the support of eCall over IMS assumed to be enabled in SNPN cells?

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| **Company** | **Answer** | **Comments**  |
| Huawei, HiSilicon | Yes | SA2 should decide this. |
| CATT | Yes |  |
| OPPO | Yes |  |
| vivo | Yes |  |
| MediaTek | Yes |  |
| Intel | Yes | SA2 is discussing draft CRs assuming that eCall will be supported, but it is OK to ask. |
| Ericsson | Yes | The use case is a bit unclear when *eCall* should be supported over an SNPN as *eCalls* are intended for the automotive area and only used in Europe. |
| Nokia | Yes |  |

**Summary:** 8 companies answered, and all companies supported sending the question.

**Rapporteur's Proposal:** Send the question to SA2.

**Q10: Is it acceptable to send the following question to SA2?**

Is the broadcasting of ETWS/CMAS notifications in an SNPN cell enabled in Rel-17?

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| **Company** | **Answer** | **Comments**  |
| Huawei, HiSilicon | Yes, but further information can be provided from RAN2 perspective | SA1 should be in cc.SA1 is currently discussing whether PWS will be supported in Rel-17. Based on the feedback from our SA1 colleague, the focus of their discussion is whether there is RAN impact. Therefore, it would be helpful to provide RAN2 viewpoint in the LS, e.g. RAN2 thinks ETWS/CMAS are useful. Even if RAN2 identifies there’s no RAN2 impact, this would still be useful information to SA1.BTW, a typo should be fixed:Is the broadcasting of ETWS/CMAS notifications in an SNPN cell ~~is~~ enabled in Rel-17?Rapporteur: Typo corrected. It is OK to add SA1 in CC. |
| CATT | Yes |  |
| OPPO | No strong view | If SA1 agree, they will tell us if the discussion is on-going in SA1. |
| vivo | Yes | Agree that SA1 should be in cc as SA1 is discussing NPN support for PWS. May be SA1 can share the latest progress. |
| MediaTek | Yes | With the typo correction as suggested by Huawei |
| Intel | Yes |  |
| Ericsson | No | ETWS/CMAS support for SNPNs has been discussed in SA1 but currently there is no such requirement.We can wait for SA1 conclusion and otherwise assume no. |
| Nokia | Yes |  |

**Summary:** 8 companies answered, and 1 company does not support sending the question. Adding SA1 to the LS was also requested.

**Rapporteur's Proposal:** Send the question to SA2 and SA1 in the CC field of the LS.

# 3 Conclusions

The LS based on the Rapporteur's proposals are drafted in a separate document for further discussion.