**Agenda item:** **9.1**

**Source: China Telecom (Moderator)**

**Title: Summary of offline discussion on enhancement of Private Network Support for NG-RAN**

**Document for: Discussion**

# Introduction

Following the chairman’s guidance, the intention of this paper is to collect company views on the WID of enhanced Private Network.

# Discussion on eNPN objectives

The objectives of ePRN WID were listed as follow:

* O1: For PNI-NPN, support reporting of serving (selected) CAG ID usage, if justified;
* O2: The support of SNPN and PNI-NPN for eMTC/NB-IoT connected to 5GC;
* O3: Remaining Rel-16 issues if any;
* O4: Check the RAN impact of SA2 study on enhanced support of NPN, and specify the necessary RAN functionality;

The question on the start time of ePRN WID:

* Q1: When could the ePRN work be started if the WID is approved? (Q4 2020? Q1 2021 ? or other time?)

The companies are invited to input their views in the table

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| --- | --- | --- |
| Company | Proposals for modification of objectives of ePRN | Proposals for the start time of ePRN |
|  Huawei | Remove O2 due to discrepancy and workload impact;  We are supportive of the work. However we noticed a major features discrepancy in objective O2 which will impact a lot RAN3 and RAN2 in term of workload and also probably SA2. This was not discussed when the full picture was given for RAN3/RAN2, and seen the TU already allocated with prefer to not consider this objective in this release. | The start could be shift to Q3 considering the overall shift of the rel-17 in RAN3 |
|  Qualcomm | Remove or recast O1. In our understanding, this objective has system impact and should be started from SA2. Possible alternatives: add a statement to make this conditional on SA2, or recast so it is e.g.“RAN3 only” and requiring no support from other WGs.We are supportive of O2, can discuss further scope and workload aspects. | Start could be in Q4 2020 assuming there are topics not dependent on SA2. |
|  Nokia | We are fine to remove O1 and O2. O1 should be started and done by SA2. |  Start could be in Q4 2020 |
|  Futurewei |  We are fine to remove O1 and O2 for now.As Rel-16 is completed, O3 should be made more specific.It may be better to postpone the approval of this WID to September to have more concrete objectives of O4. |  Could be started in Q4 2020. |
|  ZTE | We are fine to remove O1 and O2. While for Q3, it seems there is no major left issues in R16, if needed, we can discuss minor left issues on TEI16.Considering that the scope of this R17 WI is mainly pending on the conclusdion from SA2, it may be better to postpone the approval of this WID to September to have more concrete objectives of O4. |  Depending on the final approved scope of this WI. |
| Intel | O1: We don’t think O1 is necessary as we don’t see a need for this reporting by UE. It is not clear what the reporting of the serving CAG ID is for.  If it is for RAN to perform CAG based policy for access control and handover, we do not see the need since it can be handled by slice based policy.  If it is for charging purpose, since 5GC needs to perform whether the UE can access the CAG cell, it will know which CAGID is used based on intersection of the UE allowed list and the broadcast list from the cell.We would also be OK to keep O1 as it is, under the assumption that WG can discuss the need for this reporting based on “if justified”.O3: The objective should clearly state what remaining Rel-16 issues need to be handled. For the CAGID specific UAC configuration, there is currently no service requirement from SA1 to support this. Currently slice based UAC configuration is supported for PNI-NPN from SA2 specification and this may be sufficient.  We don’t see a need to address these in Rel-17. |  Could be started in Q4 2020 |
|  vivo | We are also supportive of the work, However, we also find that Q1 depends on SA2 discussion.We are ok with Q2 and Q3.For Q4, we also find some dependency with SA2 progress. |  Depending on the final approved scope of this WI. |
|  Samsung | O1: we are fine to remove O1. Because it was discussed a lot in RAN3/RAN2/SA2 in Rel-16 wihtout agreement. Seems not necessary to continue.Q3: we are not sure what's the leftovers from Rel-16. More clarication is needed.Q4: the same view as ZTE. It's better to wait some progress in SA2 then we can define  concrete objectives for RAN2/3. |  Depending on the final approved scope of this WI. |
|  CATT | For Q1, we think it is related to manual CAG selection. In Rel-16, on manual CAG selection, it seems that the feedback from CT1/SA1/SA2 to RAN2/RAN3 are not quite aligned. For example, from SA2 point of view, manual CAG selection mainly applied to the scenario that there is misalignment on allowed CAG list in UE side and network side.However,CT1/SA1 request RAN2 to introduce manual CAG selection allowed indication which allow UE to select to a cell which is not in UE’s allowed CAG list. If the selected CAG ID is not reported to the network, the usage of the new introduced IE in SIB1 is unclear. Therefore, we think Q1 could discussed in Rel-17.For Q2, it depends on the real deployment requirement from operators. |  Start could be in Q4 2020 with RAN2/RAN3 only aspect |
|  LGE | We’re fine to remove O1 and O2. O1 had been discussed a lot, and it also should be triggered by SA2 if necessary. O2 has relatively big impacts, better to consider it next release.For Q4, the same view as Samsung and ZTE, it is better to wait for some progress in SA2. |  Depending on the final approved scope of this WI. |
| NEC | Remove O2, this work should limit to NR only. | With the removing of O2, we can plan to start from Q4/ 2020. Next Plenary (Sept) to check again the situation. |
| Deutsche Telekom | We only see room for O3 and O4 in Rel-17 due to the heavy load and pot. additional delay. Highly depends on the progress in SA2. | Q2 2021 earliest, pending SA2 progress |
| ORANGE | We are fine with the first 3 objectives. The objective O4 however is dependent on SA2 work which is far from completed. It is unclear at this stage what solutions will need to be specified in RAN. With this in mind it seems too early to add this objective within the WID. | Depends on the final scope of the WID. |
| CTC | **O1:** We support O1 and we think the issue of serving CAG ID could be revisited in Rel-17 as this information can be helpful for operator knowing the detail usage of CAG cell and optimizing CAG cells, in addition all the other similar IDs (serving PLMN ID, serving SNPN ID, NSSAI) are allowed to be transmitted, why is CAG discriminated?**O2:** We support O2, since many world operators have deployed the NB-IoT networks, it is utmost to support the combination of NPN and the existing NB-IoT networks.**O3:** It just keeps the door open for the discussion for other RAN related NPN issues if identified.**O4:**The completion time of SA2 eNPN SI has been extended from Q1 2020 --> Q2 2020 --> Q3 2020? Q4 2020. I also wish to define concrete objectives for RAN based on SA2 progress, however from the experience of NPN WI work in Rel-16, as we sent a lot of LSs to SA2, SA3, SA1 to align our understanding with them, actually some further works of SA2 NPN were triggered from our side. Therefore, as we are bound by the SA2 progress, we should not expect we can have the very clear and concrete objectives at the beginning, we may investigate and specify the solutions of eNPN at same time.So, we can outline the objectives in high level. | Could be started in Q4 2020, If the completion time of SA2 eNPN SI changes again, we could   update our plan according |
| philips | O1: should be added if SA2 decides this is needed.O2: this feature is important to support NPNs for real-world deployment scenarios of eMTC/NB-IoT of many verticals. Given that the evolution path of 5G includes eMTC/NB-IoT as the primary RAT to enable massive LPWA IoT solutions for 5G, it should be given the same deployment flexibility options as other RATs in the 5GS, including support for NPNs.O3: having a placeholder is good, but should be clear by now which concrete topics need to be addressed. If so, these should beadded.O4: placeholder is necessary, since eNPN work in SA2 since it is already pretty clear that some key issues have RAN impact, such as network selection enhancements and service continuity for KI#1, and indication of onboarding network for KI#4. | Start could be in Q4 2020 |
| Lenovo / Motorola Mobility | From our side we consider O3 and O4 as highest priority. On O3: From SA/CT perspective the NPN functionality is supported for NG-RAN, but due to lack of time NPN is supported in RAN for NR only in Rel-16. Therefore, as the main Rel-16 leftover NPN should be supported for EUTRA/5GC in Rel-17. | For O3: Q4 2020; for O4: Q1 2021 in accordance with SA2 conclusions |
| Spreadtrum Communications | We are fine to wait for SA2 inputs to decide whether O1 and O4 are needed.Although O3 may lead to more work, this object does have some benefits in certain deployment scenarios. So we think more discussions on the scope and workload are worthwhile. | O3 could be started in Q4 2020, other Objects depend on more inputs. |

# Summary and Proposals

According to company’s input, the summary and proposals on ePRN WID were as follow:

* For O1, some companies considered this issue should be triggered by SA2, but some other companies also considered this issue could be revisited in Rel-17.
	+ **Proposal 1: To remove O1 from the ePRN WID;**
* For O2, some companies (7 companies) considered this feature will impact a lot RAN3 and RAN2 in term of workload, but some other companies (8 companies) are ok for it.
	+ **Proposal 2: Try to narrow down the scope of O2 to engage more support;**
* For O3, some companies considered the more clarification of O3 is needed.
	+ **Proposal 3: To remove O3 from the ePRN WID;**
* For O4, almost all companies considered there will be the RAN impact from SA2 eNPN SI, few companies suggest to wait for SA2 progress to have more concrete objectives.
	+ **Proposal 4: Finalize O4 to engage more support;**
* For Q1, 11 companies considered the start time of this WID could be Q4 2020 or earlier, 5 companies thought it depends on the final approved scope of this WI, a company suggested a later time than Q4 2020.
	+ **Proposal 5: The start time is Q4 2020 tentatively, it should be changed according to the progress of SA2 eNPN SI.**
	+ **Proposal 6: Try to revise the WID for convergence.**

# References

1. RP-200734, Summary of email discussion on enhancement of Private Network Support for NG-RAN, CTC.
2. RP-200735, Motivation on enhancement of Private Network Support for NG-RAN, CTC.
3. RP-200736, New WID: Enhancement of Private Network Support for NG-RAN, CTC