3GPP TSG-RAN WG2 Meeting #114 Electronic [R2-2106502](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_114-e/Docs/R2-2106493.zip)

Elbonia, 19 – 27 May 2021

**Agenda item: 8.3.2**

**Source: vivo (Rapporteur)**

**Title: [AT114-e][240][Multi-SIM] UE assistance information of paging collision (vivo)**

**WID: LTE\_NR\_MUSIM-Core**

**Document for: Discussion and Decision**

# Introduction

This document aims to collect views from companies for the following discussion agreed during RAN2#114e:

* [AT114-e][240][Multi-SIM] UE assistance information of paging collision (vivo)

Scope:

* + - Discuss whether and which UE assistance information is needed for avoiding paging collision in MUSIM.
    - Should explain what happens if 1) if no assistance information is provided and 2) if assistance information is provided.

Intended outcome:

* + - Discussion summary in [R2-2106502](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_114-e/Docs/R2-2106493.zip) (by email rapporteur).

Deadline for providing comments, for rapporteur inputs, conclusions and CR finalization:

* + - Initial deadline (for companies' feedback): 2nd week Tue, UTC 1200
    - Initial deadline (for rapporteur's summary): 2nd week Wed, UTC 1200

To make it easier to find the correct contact delegate in each company for potential follow-up questions, the rapporteur encourages the delegates who provide input to provide their contact information in this table:

|  |  |
| --- | --- |
| Company | Contact: Name (E-mail) |
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# Discussion

During online discussion, 15 companies support that UE can indicate the assistant information (AS or NAS) to network for paging collision avoidance, while 9 companies against this assistant information. According to the contributions submitted in this meeting, the benefit of providing UE assistant information include:

* UE has the best knowledge to determine the best offset for avoiding paging collision by considering RAN parameters in this network and the POs in the other attached network(s), and thereby reduce the number of requests to resolve the PO collision.
* UE can provide preferred value for better power saving, e.g., simultaneously paging monitoring for dual RX multi-USIM device;

While the reasons for doubting the necessary of UE assistant information are given as follows:

* Paging collision is a very low probability issue. If the old 5G-S-TMSI causes collision, then in principle a new 5G-S-TMSI will avoid the collision at least in the current cell. If it happens, the UE can always request a further reassignment or solve it via UE or NW implementation.
* paging collision can be solved without assistance information for that the PO is periodically distributed and the possible paging cycle is specified to be {rf32, rf64, rf128, rf256}.
* UE assistance information may force network to choose a right 5G-GUTI value and avoid paging collision. If it works like other assistance information, it is likely that the network still free to have its own assignment. So, the additional information could not guarantee to solve the problem.

RAN2 has agreed that NAS signalling is baseline for UE reporting paging collision issue in 5GS side. So, the rapporteur understands that it is more reasonable for the UE to send assistant information to CN via NAS signalling. However, there is one contribution [8] propose that for RRC inactive UE can provide RRC assistant information to RAN for avoiding collision in RRC\_INACTIVE state. The RRC assistance information can indicate the RAN paging cycle to be selected to avoid the collision in RRC\_INACTIVE state. The RRC assistance information may also indicate offset to be applied on paging occasion calculation for RRC\_INACTIVE. So, the rapporteur would like to separate the different cases **(NAS assistant information NAS or RRC assistant information)** to discuss this issue.

Now, companies are kindly invited to answer the below question, with providing your technical reasons to support/against UE assistant information for paging collision avoidance(e.g., what happens if UE assistant information is provided or not). Hopefully, these technical reasons can help us to reach some consensus or go in a direction with clear majority support.

1. **Do you think whether and which signalling shall be supported for sending NAS assistant information?**

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| **Company** | **Need assistant information or not** | **Which UE assistance information (e.g., UE\_ID offset) if need** | **Technical reasons** |
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**Summary:**

TBD.

1. **Do you think whether and which signalling shall be supported for sending RRC assistant information?**

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| --- | --- | --- | --- |
| **Company** | **Need assistant information or not** | **Which UE assistance information (e.g., UE\_ID offset) if need** | **Technical reasons** |
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Companies are invited to express their view if any other overall comments or suggestions.

1. **Any other comments or suggestions?**

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| **Company** | **Comments** |
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**Summary:**

TBD.

# Conclusions

Based on the email discussion, we give the below proposals.

TBD

# References

1. R2-2104764 Paging Collision Avoidance OPPO discussion Rel-17 LTE\_NR\_MUSIM-Core
2. R2-2104970 Paging collision avoidance for MUSIM device Asia Pacific Telecom, FGI discussion
3. R2-2104991 On Paging Collision Avoidance Solution Samsung discussion
4. R2-2105075 Definition and solution for paging collision, RRC Inactive, SI change Lenovo, Motorola Mobility discussion LTE\_NR\_MUSIM-Core
5. R2-2105084 MUSIM Page Collision Avoidance Apple discussion Rel-17 LTE\_NR\_MUSIM-Core
6. R2-2105164 Consideration on the Paging Collision ZTE Corporation, Sanechips discussion Rel-17 LTE\_NR\_MUSIM-Core
7. R2-2105194 Further Consideration on Paging Collision Avoidance CATT discussion Rel-17 LTE\_NR\_MUSIM-Core
8. R2-2105227 RAN Impacts for paging collision avoidance solutions for Multi-SIM Nokia, Nokia Shanghai Bells discussion Rel-17
9. R2-2105258 Options for paging collision avoidance Qualcomm Incorporated discussion
10. R2-2105269 Paging Collision avoidance vivo discussion Rel-17 LTE\_NR\_MUSIM-Core
11. R2-2105374 UE indication of paging collision for Multi-SIM ASUSTeK discussion Rel-17 LTE\_NR\_MUSIM-Core
12. R2-2105682 Discussion on paging collision avoidance in Multi-SIM Sony discussion Rel-17 LTE\_NR\_MUSIM-Core
13. R2-2105899 Paging Collision Avoidance for Multi-SIM Charter Communications, Inc discussion
14. R2-2105917 Paging Collision Avoidance Open Issues Huawei, HiSilicon discussion Rel-17
15. R2-2105978 Paging collision avoidance Ericsson discussion
16. R2-2106101 36.304 change for SA2 agreed NAS based IMSI offset signaling in EPS Intel Corporation discussion Rel-17 LTE\_NR\_MUSIM-Core
17. R2-2106102 5G-S-TMSI re-assignment is “enough” for paging collision avoidance in 5GS Intel Corporation discussion Rel-17 LTE\_NR\_MUSIM-Core
18. R2-2106109 Considerations on Paging Collision LG Electronics discussion Rel-17 LTE\_NR\_MUSIM-Core R2-2103572
19. R2-2106343 Paging collision avoidance for MUSIM device MediaTek Inc. discussion LTE\_NR\_MUSIM-Core R2-2104151
20. R2-2106398 Discussion of the paging collision problem in 5GS Xiaomi Communications discussion