**SA WG2 Meeting #143E S2-20xxxxx**

**24 February-09 March 2021, Electronic (revision of S2-20xxxx)**

**Source: Intel (Rapporteur)**

**Title: FS\_MUSIM moderated email discussion**

**Document for: Information**

**Agenda Item: TBD**

**Work Item / Release: FS\_MUSIM / Rel-17**

*Abstract of the contribution: This contribution includes the moderated email discussions for the FS\_MUSIM open issues.*

# 1. Introduction

This document includes a request for companies to provide their opinion on selected FS\_MUSIM open issues.

The result will be used as an input to a proposed conclusion at SA2#143E, and possibly we will target a working assumption at CC#1.

# 2. Discussion

## 2.1 Sending of Paging Cause

In relation to the following NOTE in TR 23.761 Clause 8.1:

*NOTE 1: During normative phase, it will be determined whether the Paging Cause is applied 1) only for UEs with the request, or 2) to all UEs indiscriminately.*

Companies are invited to provide their opinions in the table below.

**Q.1**: Please indicate whether the Paging Cause is applied by the network only for UEs that have requested it (e.g. in the MUSIM capability) or indiscriminately.

|  |  |
| --- | --- |
| **Company name** | **Comments** |
| Spreadtrum | Prefer  *1) only for UEs with the request* |
| OPPO | We support “only for UE that have requested”, because unnecessary paging cause can be avoided |
| Qualcomm | Paging Cause is applied indiscriminately. |
| Huawei | To send the paging cause all related entities need to support it (i.e. UE, RAN and CN).  A UE should inform the CN it supports receiving the voice paging cause. When the cause is sent, it adds overhead ***all*** UEs that receive the paging message.  A simple indication of support to/from the UE solves the issues related to CN nodes and a simple indication of support in RAN solves the legacy RAN issues.  It should only be sent if all the entities support it and the UE requests it.  The same solution can be applied to 5GS and EPS. |

## 2.2 Paging Cause and legacy RAN node

In relation to the following NOTE in TR 23.761 Clause 8.1:

*NOTE 2: Whether and how the UE discriminates (if needed) between paging for non-voice service and paging from legacy RAN node is FFS and will be determined during normative phase.*

While the exact mechanism allowing the UE to discriminate between the two cases mentioned in the NOTE has RAN dependency, the highlighted text (“if needed”) can be answered from system-level perspective.

Companies are invited to provide their opinions in the table below.

**Q.2**: Please indicate whether the UE needs to discriminate the case where the absence of Paging Cause in the Uu Paging message is due to a non-voice MT service from the case where the absence of Paging Cause in the Uu Paging message is due to a legacy RAN node (i.e. regardless whether the MT service is voice or not).

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| --- | --- |
| **Company name** | **Comments** |
| Spreadtrum | The UE does NOT need to discriminate the two cases. |
| OPPO | Leave it to RAN WG, since RAN may resolve the issue by encoding. |
| Qualcomm | UE needs to discriminate the two case. How to discriminate depends on RAN’s decision. |
| Huawei | If the paging cause is only used after the indications of support as described in 2.1, then it is always clear to the UE whether it is absent or not supported. Indications of support (for example in System Information) solve the issue related to the UE knowing whether the RAN node supports the paging cause.  This solves the issue for both 5GS and EPS. |

## 2.3 RRC-based Busy Indication in RRC\_Inactive

The cover page of TR 23.761 submitted to SA#90E plenary for information ([SP-200968](https://www.3gpp.org/ftp/tsg_sa/TSG_SA/TSGs_90E_Electronic/Docs/SP-200968.zip)) includes the following outstanding issue:

*Progress on the RRC-based Busy Indication enabler for UE in RRC\_Inactive state depends on progress in RAN2 and RAN3.*

From SA2 perspective the impact is whether to extend the NAS-based Busy Indication procedure to RRC\_Inactive or whether to define a new system-level procedure for RRC-based Busy Indication (please note that TR 23.761 solution #3 currently has no call flow for the RRC-based Busy Indication).

Another unknown is that RAN#90E plenary has not decided whether TS 36.331 changes are allowed for Busy Indication, according to the following conclusion in the [RAN#90 plenary meeting report](https://www.3gpp.org/ftp/tsg_ran/TSG_RAN/TSGR_90e/Report/draft_MeetingReport_RAN_90e_201211_eom.zip):

***RP-202894******Moderator's summary of email discussion*** ***Vivo***

***[90E][30][R17\_MultiSIM\_scope]***

*covered Tdocs 2356, 2647, 2731, 2743, 2649*

*proposal: Inclusion of TS 36.331 will be revisited in the next RAN plenary after RAN2/RAN3 discussion on paging cause that SA2 agreed for both EPS and 5GS.*

*conclusion: proposal is endorsed*

This means that, even if RRC-based Busy Indication is agreed by RAN WGs, it may be applicable only to NR/5GC, but not to LTE/5GC.

The RAN WG meetings are taking place from 25 Jan to 05 Feb, meaning that their conclusion may not be available before SA2#143E submission deadline.

The RRC-based Busy Indication also has SA3 dependency. In their LS reply (S2-2008353) SA3 provided the following answer:

*SA3 answer: Sending an unsecured busy indication in an RRC message is a security risk. This need to be avoided.*

This aspect is included in the SA3 study on MUSIM security ([SP-201131](https://www.3gpp.org/ftp/tsg_sa/TSG_SA/TSGs_90E_Electronic/Docs/SP-201131.zip)) that is due for completion in March 2021.

This clause aims at checking if there is a preference in SA2 to conclude on extending the NAS-based Busy Indication procedure to RRC\_Inactive, or whether SA2 should wait for RAN and SA3 WG’s feedback before concluding.

Companies are invited to provide their opinions in the table below.

**Q.3**: Should the use of NAS-based Busy Indication be extended to RRC\_Inactive or should SA2 wait for RAN and SA3 WG’s feedback before concluding?

|  |  |
| --- | --- |
| **Company name** | **Comments** |
| Spreadtrum | SA2 should wait for RAN and SA3 WG’s feedback before concluding. |
| OPPO | The busy indication in RRC-Inactive should be determined by RAN2 and SA3. SA2 does not need to do anything. |
| Qualcomm | SA2 should wait for RAN and SA3’s feedback. |
| Huawei | The question should be postponed to the next meeting.  A stable NAS-based Busy Indication should be agreed before we discuss whether it can be extended to RRC\_Inactive.  The NAS-based Busy Indication shares similarity with coordinated leaving procedure (i.e., no paging for certain period), so it may end up with a single procedure. It is proposed to settle down the NAS-based Busy Indication in this meeting and leave the RRC\_Inactive to next meeting. |

## 2.4 Paging Filtering

In relation to the following EN in TR 23.761 Clause 8.1:

*Editor's note: According to the conclusion in KI#3, upon NAS-level leaving the UE may provide assistance information including information to temporarily restrict/filter MT data in this network while the UE has left. Whether UE is allowed to provide information to temporarily restrict/filter MT data in other circumstances is FFS.*

The attempt to resolve this EN in SA2#142E was unsuccessful (refer to the [EMEET discussion](https://list.etsi.org/scripts/wa.exe?A2=ind2011C&L=3GPP_TSG_SA_WG2_EMEET&O=D&P=4336253) on baseline document S2-2008924) and the underlying proposal has no RAN dependency.

Companies are invited to provide their opinions in the table below.

**Q.4**: Can we simply delete the EN or do you see the need for further discussion on this EN?

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| --- | --- |
| **Company name** | **Comments** |
| Spreadtrum | Prefer to simply delete the EN. |
| OPPO | No strong opinion |
| Qualcomm | It is OK to delete the EN. |
| Huawei | The assistance information should only be sent during coordinated leave procedure, and the use of the procedure should not be extended. |

## 2.5 Enabling paging reception for 5GS

The cover page of TR 23.761 submitted to SA#90E plenary for information ([SP-200968](https://www.3gpp.org/ftp/tsg_sa/TSG_SA/TSGs_90E_Electronic/Docs/SP-200968.zip)) includes the following outstanding issue:

*Progress on enabling paging reception for 5GS depends on progress in RAN2.*

In their LS reply ([S2-2009092](https://www.3gpp.org/ftp/tsg_sa/WG2_Arch/TSGS2_142e_Electronic/Docs/S2-2009092.zip)) RAN2 provided the following answer:

***From RAN2 point of view, Solution 1, 2a, 2b, and 3 are feasible to solve paging collision issue in 5GS. On their effectiveness, RAN2 will continue to evaluate their pros and cons.***

The attempt to resolve this EN in SA2#142E was unsuccessful (refer to the [EMEET discussion](https://list.etsi.org/scripts/wa.exe?A2=ind2011C&L=3GPP_TSG_SA_WG2_EMEET&O=D&P=4397570) on baseline document S2-2008718), several companies proposing to wait for RAN2 to complete their evaluation.

In Rapporteur’s understanding there is a consensus to use the Registration procedure when UE detects a possible collision, whereas the differences are whether UE and AMF need to keep track of an additional UE-ID for the purpose of PO calculation, and whether UE may provide UE-ID offset in the Registration Request, as captured in S2-[2008718r07](https://www.3gpp.org/ftp/tsg_sa/WG2_Arch/TSGS2_142e_Electronic/INBOX/Revisions/S2-2008718r07.zip) (which seemed to have significant support):

* *When a MuSIM device detects a paging collision, the MuSIM device requests mobility registration request to the 5GS network.*
* *The AMF allocates the new 5G GUTI in the accept message as described in clause of 6.12.3 in TS 33.501[12].*

*Editor's note: It will be determined during normative phase whether UE and AMF need to keep track of an additional UE-ID (different from 5G-GUTI) for the purpose of PO calculation.*

*Editor’s note: It will be determined during normative phase whether UE may provide UE-ID offset for AMF to allocate the new 5G-GUTI.*

This clause aims at checking if SA2#143E should work on a normative CR based on the Registration procedure (e.g. as in the proposed conclusions in [S2-2008718r07](https://www.3gpp.org/ftp/tsg_sa/WG2_Arch/TSGS2_142e_Electronic/INBOX/Revisions/S2-2008718r07.zip)), leaving either or both of the open points in ENs (to be resolved once RAN2 have completed their evaluation).

Companies are invited to provide their opinions in the table below.

**Q.5**: Should SA2#143E work on a normative CR based on the Registration procedure (e.g. as proposed in S2-2008718r07), leaving the unresolved aspects in ENs? Or should SA2 wait for RAN2 to complete their evaluation first?

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| --- | --- |
| **Company name** | **Comments** |
| Spreadtrum | SA2 should wait for RAN2 to complete their evaluation first |
| OPPO | We support NAS based solution only. |
| Qualcomm | Prefer to wait for RAN2’s evaluation. |
| Huawei | No additional parameters / information is required.  The registration procedure can be used to request a new 5G-GUTI in CM\_CONECTED. If the UE is entering CM\_CONNECTED (i.e. it’s coming from IDLE), then the UE will be assigned a new value anyway, so nothing new is required. |

## 2.6 5GS Leaving

The cover page of TR 23.761 submitted to SA#90E plenary for information ([SP-200968](https://www.3gpp.org/ftp/tsg_sa/TSG_SA/TSGs_90E_Electronic/Docs/SP-200968.zip)) includes the following outstanding issue:

*- The decision to support NAS-based leaving or RRC-based leaving or both for 5GS depends on the progress on RRC-based leaving procedure for 5GS in RAN2.*

While RAN2 have already started the discussion on the feasibility of the RRC-based Leaving procedure, there is again an issue with the lack of guidance from RAN#90E plenary on whether TS 36.331 changes are allowed for the RRC-based Leaving procedure (refer to the endorsed conclusion from RAN#90E plenary report referenced in clause 2.3 of this document).

This means that, even if RRC-based Leaving is agreed by RAN WGs for NR/5GC, it may not be applicable to LTE/5GC.

The RAN WG meetings are taking place from 25 Jan to 05 Feb, meaning that their conclusion may not be available before SA2#143E submission deadline.

This clause aims at checking if there is any new element that would allow SA2#143E to conclude ahead of the RAN WG’s feedback.

Companies are invited to provide their opinions in the table below.

**Q.6**: Please indicate whether you see a possibility for SA2#143E to make further progress on the type of 5GS Leaving procedure (i.e. NAS-based only vs RRC-based only vs both) and how this can be achieved. Alternatively, this topic will need to be postponed to SA2#144E.

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| --- | --- |
| **Company name** | **Comments** |
| Spreadtrum | This topic needs to be postponed to SA2#144E for waiting the feedback from RAN. |
| OPPO | We prefer NAS based solution, but as a way forward, we propose that both methods are specified |
| Qualcomm | Prefer NAS-based solution, as a compromise, we do not object to support both NAS and RRC based solution. |
| Huawei | It is better to postpone until RAN have done their work. There is time to coordinate/address this in Q2.  If RAN2 reaches consensus in Q1, we are also fine to see any progress can be achieved in SA2#143E. |

## 2.7 Assistance information in Leaving request

In relation to the following ENs in TR 23.761 Clause 8.3:

*Editor's note: It is FFS whether the assistance information is common for EPC and 5GC, e.g., whether the assistance information in EPC supports only partial features comparing to 5GC.*

*Editor's note: Whether need an indication that the UE is leaving for a "short duration" in assistance information is FFS.*

*Editor's note: Whether need the expected leaving time/duration in assistance information is FFS. How the UE selects the proper value for expected leaving time/duration is FFS*

*Editor's note: Whether this information preferences for MT service delivery indication using non-3GPP access is FFS.*

Companies are invited to provide their opinions in the table below.

**Q.7.1**: Should the assistance information be the same for EPC and 5GC? If “No”, please justify why.

**Q.7.2**: Should the assistance information include an indication that the UE is leaving for a “short duration” (i.e. without any leaving time / duration expressed in seconds)?

**Q.7.3**: Should the assistance information include an indication of the expected leaving time / duration (i.e. expressed in seconds)?

**Q.7.4**: Should the assistance information include a preference for MT service delivery using non-3GPP access? If “yes”, please justify why.

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| --- | --- |
| **Company name** | **Comments** |
| Spreadtrum | **Q.7.1**: Yes  **Q.7.2**: No  **Q.7.3**: No  **Q.7.4**: No |
| OPPO | Q 7.1: Yes  Q 7.2: No. If periodic gap negotiation is supported in RAN2, then the “short duration” is not needed in SA2.  Q7.3: No. We don’t think UE can properly and accurately expect leaving time/duration.  Q7.4: No. |
| Qualcomm | 7.1: Yes.  7.2: No.  7.3: if only NAS based leaving is supported, it is useful to indicate the leaving time for some cases that UE can determine the “leaving time”, e.g. periodic RAU. If we select RRC based solution or both RRC and NAS solution, there is no need to send the “leaving time”.  7.4: No. |
| Huawei | Q7.1  The assistance information agreed in clause 8.3 should be common for EPS and 5GC. However, as indicated in Q.6, how this assistant information is sent to AMF is still FFS, i.e. via NAS signaling directly from UE or via N2 signaling relayed from RAN.  Q7.2 and Q7.3  A “short duration” or “time” is not required, brings no benefit and additional complexity.   * A NAS message is not appropriate to request RAN keeps the UE in RRC\_Connected but is “absent” or “not schedulable” for a short time period, which is the RAN decision. * If “short duration” is agreed to be supported, an “absence” requires tighter timing control between the UE and RAN, i.e. define by AS layer. There is ongoing discussion in RAN2 related to this issue, i.e., [post112-e][256][Multi-SIM] Network switching details. * In addition, in case the NAS leaving procedure is triggered in EPC, the UE moves into CM-IDLE/RRC-IDLE, as there is no RRC inactive state in EPS.   Q7.4  No need to indicate N3GPP MT service delivery preference. Brings additional complexity and no benefits. |

# 3. Rapporteur’s Summary

# 4. Proposed Conclusions