**SA WG2 Meeting #149-e (e-meeting) S2-2101267**

**14-25 February 2022, Elbonia**

**Title:** **Draft Reply LS on alternative IMSI for MUSIM**

**Reply to:** **LS to SA2 and CT1 on alternative IMSI for MUSIM (R2-2201718, S2-2201252)**

**Release: Release 17**

**Work Item: MUSIM**

**Source:** SA2

**To:** RAN2

**Cc:** CT1, RAN3

**Contact person: Lars Nord**

**Lars.nord@sony.com**

**Send any reply LS to: 3GPP Liaisons Coordinator,** [**mailto:3GPPLiaison@etsi.org**](mailto:3GPPLiaison@etsi.org)

**Attachments:** -

# 1 Overall description

SA2 thanks RAN2 for the LSs (R2-2111329/S2-2200018 and R2-2201718/S2-2201252) on alternative IMSI for MUSIM. SA2 has discussed the LSs and would like to provide the following information.

When SA2 selected and specified the solution using Alternative IMSI Offset, the expectation from SA2 was that minimal impact would be required on the current UE, MME and eNB behaviour, except the calculation of the Alternative IMSI value.

TS 23.401 clause 4.3.33.5 (see annex) specifies that the UE may receive Accepted IMSI Offset over NAS signalling. Then:

- For the UE:

- The UE shall then use the Accepted IMSI Offset to calculate the Alternative IMSI value which is then used in the UE to derive UE ID which is later used in the PO/PF calculations.

- The behaviour inside the UE is not SA2 responsibility, so any behaviour could be compatible as long as the outcome is what is expected in terms of computation of the paging occasions, therefore there is no misalignment between SA2 and CT1/RAN2 about how UEs NAS and the UEs AS use Alternative IMSI.

- For the MME:

- The MME provides the UE ID, derived from the Alternative IMSI value calculated based on the IMSI and the Accepted IMSI Offset, to the eNB.

- S1AP does not require any updates to support this MUSIM feature and no impacts to eNB PO/PF calculations.

Furthermore, SA2 believe it may be good to specify how the Alternative IMSI value is calculated in only one specification to avoid misalignment. During the discussions SA2 have noticed that this calculation in RAN2’s running CR is different compared to the SA2 specification, see annex below. RAN2’s way of calculating the Alternative IMSI value, can result in a value outside the value range of an IMSI. SA2 kindly request RAN2 to align with SA2 specification or refer the calculation of Alternative IMSI value to TS 23.401.

# 2 Actions

**To RAN2**

**ACTION:** SA2 kindly request RAN2 to align with SA2 specification or refer the calculation of Alternative IMSI value to TS 23.401.

# 3 Dates of next TSG SA WG2 meetings

3GPPSA2#150-e 4 - 8 April 2022 Electronic Meeting

3GPPSA2#151-e 16 - 20 May 2022 Electronic Meeting

# ANNEX

TS 23.401 text that specifies the aspects in the RAN2 LS from clause 4.3.33.5on "Paging Timing Collision Control".

|  |
| --- |
| 4.3.33.5 Paging Timing Collision Control To avoid possible paging occasion collision and to enhance the likelihood that paging is received successfully for different USIMs, a Multi-USIM UE may provide, for at least one USIM, a Requested IMSI Offset value that is used for the determination of paging occasions. Upon reception of a Requested IMSI Offset value from UE in Attach Request or Tracking Area Update Request, a supporting MME provides an Accepted IMSI Offset value to the UE in the Attach Accept or Tracking Area Update Accept message to acknowledge it supports the feature and provide the accepted value. The Accepted IMSI Offset Value may be different from the Requested IMSI Offset provided by the UE. The Alternative IMSI value, determined as below, is stored in the UE context in the MME. If the UE does not provide any Requested IMSI Offset value in Attach Request or Tracking Area Request, the MME removes any stored Alternative IMSI value in the UE context. The UE and the network use the Accepted IMSI Offset to determine the paging occasion. The UE and MME use the Accepted IMSI Offset value to calculate the Alternative IMSI value that is determined based on UE's IMSI as follows:  Alternative IMSI value = [MCC] [MNC] [(MSIN value + Accepted IMSI Offset) mod (MSIN address space)]  where: the MCC, MNC and MSIN value are the fields of the UE's IMSI as defined in TS 23.003.  The MME uses the Alternative IMSI value to compute the UE Identity Index Value. The MME sends the UE Identity Index Value to RAN in the Paging message (see TS 36.413 [36]) for RAN to derive the paging occasions according to TS 36.304 [34].  The UE uses the Alternative IMSI value for the determination of paging occasions as specified in TS 36.304 [34].  NOTE 1: It is recommended to avoid excessive signalling load from UE due to this procedure.  NOTE 2: The MME does not remove Alternative IMSI value if the Tracking Area Update Request is for periodic Tracking Area Update. |