**3GPP TSG-SA3 Meeting #103-e *S3-212124r7***

e-meeting, 17 - 28 May 2021

**Title: LS on Clarifications of Network slice selection during AMF Reallocation**

**Response to: N/A**

**Release: Rel. 17**

**Work Item: FS\_AMFREAL\_SEC**

**Source: Lenovo, Motorola Mobility to be SA3**

**To: SA2**

**Cc: CT1**

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**Attachments:** TR 33.864

# 1 Overall description

SA3 is currently working on the "Study on the security of Access and Mobility Management Function (AMF) re-allocation" in TR 33.864. The study is focusing on addressing the security handling related to AMF re-allocation and indirect reroute via RAN specified in TS 23.502 Clause 4.2.2.2.3 "Registration with AMF re-allocation", option 7(B). According to the procedure, if the initial AMF (which received the UE registration Request) finds that it is not capable to serve a UE then the registration request will be rerouted to the selected target AMF via RAN and the initial AMF will provide the information (such as AMF set and Allowed NSSAI) to enable the RAN to select the suitable target AMF.

The problem with the existing AMF reallocation and reroute via RAN procedure is the following. During the registration procedure with SUCI or 5G-GUTI (i.e., initial registration or mobility registration update procedure), if the initial AMF sets up NAS security with UE soon after the primary authentication and determines that "an AMF reallocation and Reroute via RAN" is required, then after the rerouting of the registration request to the target re-allocated AMF, the target reallocated AMF will not have any NAS security context for the UE. All unprotected NAS message(s) sent by the re-allocated target AMF to the UE (ex. to initiate an Authentication) will not be processed by the UE. In this case, the registration would fail subsequently as the UE which has established a secure NAS exchange with the initial AMF will not process any unprotected NAS message(s) sent by the re-allocated target AMF.

## 1.2 Questions

To solve the above repeated registration failure issue, SA3 is discussing solutions 6 and 7 from the TR 33.864 that have the following points as their core principle, which need to be evaluated by SA2:

1. The initial AMF uses the Requested NSSAI (if available to the AMF) and subscribed NSSAI along with existing information/inputs for Network slice selection using Nnssf\_NSSelection\_Get service operation defined in TS 23.502.

2. If the Requested NSSAI is not available to Initial-AMF, the initial AMF does not performs NAS SMC to fetch Requested NSSAI (contained in, e.g. Full Registration Request), and performs Nnssf\_NSSelection\_Get service operation defined in TS 23.502 with subscribed NSSAI along with existing information/inputs for Network slice selection.

3. If the initial AMF determines that a reroute via RAN is required, the initial AMF skips NAS SMC with UE:

The CT1 TS 24.501, clause 5.4.1.2 "EAP based primary authentication and key agreement procedure, states the following: *If the authentication of the UE completes successfully and the serving AMF does not intend to initiate a security mode control procedure bringing into use the partial native 5G NAS security context created by the EAP based primary authentication and key agreement procedure, then the EAP-success message, and the ngKSI are transported from the network to the UE using the AUTHENTICATION RESULT message of the EAP result message transport procedure.*

*NOTE 1: The serving AMF will not initiate a security mode control procedure after the EAP based primary authentication and key agreement procedure e.g. in case of AMF relocation during registration procedure.*

Based on the above information SA3 would like to know the views of SA2 for the following questions respectively.

* **Question 1 to SA2:** Is it feasible for the initial AMF during initial registration procedure (example., Registration Request with SUCI) after successful ‘primary authentication’ and successful ‘slice selection subscription data’ retrieval from UDM to perform network slice selection using Nnssf\_NSSelection\_Get service operation without Requested NSSAI, but using all other existing IE as inputs (e.g., subscribed NSSAI etc.) ?
* **Question 2 to SA2:** Is it feasible for the initial AMF during mobility registration update procedure (i.e., Registration Request with 5G-GUTI. If a UE cannot be identified with 5G-GUTI, then the AMF performs identity request/response procedure and gets SUCI to perform ‘primary authentication’) after a successful ‘slice selection subscription data’ retrieval from UDM to perform network slice selection using Nnssf\_NSSelection\_Get service operation without Requested NSSAI, but using other existing IE as inputs (e.g., subscribed NSSAI etc.)?
* **Question 3 to SA2:** For the scenarios described in Q1 and Q2 is it feasible to use TS 23.502 Clause 5.2.16.2.1 Nnssf\_NSSelection\_Get service operation for network slice selection during registration procedure, which uses Requested NSSAI (as optional IE) and Subscribed NSSAI (as mandatory IE) along with other existing inputs?
* **Question 4 to SA2:** Can AMF skip NAS SMC for retrieving Full Registration Request containing Requested-NSSAI before performing Nnssf\_NSSelection\_Get service operation?
* **Question 5 to SA2:** Can the initial AMF determines NAS reroute is needed without requested S-NSSAI? If yes, how can the initial AMF obtain target AMF information without Requested S-NSSAI from NSSF? i.e. Does NSSF need Requested S-NSSAI to determine the target AMF info?
* **Question 6 to SA2**: How can target AMF obtains the requested S-NSSAI? After the target AMF receives Requested S-NSSAI, is it possible that AMF reallocation will occur?
* **Question 7 to SA2:** Can the solutions 6 and 7 meet the SA2 working principles for the AMF re-allocation and reroute via RAN and related network slice selection principles for registration?

# 2 Actions

**To SA2:**

**ACTION:** 3GPP TSG SA WG3 kindly asks SA2 to answer the above SA2 related questions.

**To CT1:**

**ACTION:** 3GPP TSG SA WG3 kindly asks CT1 to take the above information into account.

# 3 Dates of next TSG SA WG 3 meetings

SA3#103Bis-e 5 - 9 ~July 2021 Electronic meeting (TBC)

SA3#104-e 16 - 27 August 2021 Electronic meeting