**3GPP TSG-SA3 Meeting #116 *draftS3-241906\_r1***

Jeju, South Korea, 20th - 24th May 2024

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **33.535** | **CR** | **0214** | **rev** | **-** | **Current version:** | **18.3.0** |  |
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| *For* ***[HE](http://www.3gpp.org/3G_Specs/CRs.htm%22%20%5Cl%20%22_blank)******[LP](http://www.3gpp.org/3G_Specs/CRs.htm%22%20%5Cl%20%22_blank)*** *on using this form: comprehensive instructions can be found at <http://www.3gpp.org/Change-Requests>.* |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network | **X** |

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| ***Title:***  | CR to update the procedure for AAnF requesting UE roaming status reports |
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| ***Source to WG:*** | ZTE Corporation |
| ***Source to TSG:*** | S3 |
|  |  |
| ***Work item code:*** | AKMA |  | ***Date:*** | 2024-05-13 |
|  |  |  |  |  |
| ***Category:*** | F |  | ***Release:*** | Rel-18 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)…Rel-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
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| ***Reason for change:*** | In the existing procedure of AAnF response with UE identity, the AAnF subscribe to UDM for UE roaming status reports describe in steps 5-6. Steps 5-6 can happen before steps 3-4 at any time after AAnF receives the key request from AF. Also, the GPSI is not needed in the Nudm\_EventExposure\_Subscribe request because AAnF has SUPI and AAnF may not have GPSI if step 5 happens before step 3.For the change in step 9, if the failure is due to AKMA roaming issue, the UE shall not initiate a new session establishment request.  |
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| ***Summary of change:*** | Update the procedure for AAnF requesting UE roaming status reports from UDM. |
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| ***Consequences if not approved:*** | Incomplete Specification. |
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| ***Clauses affected:*** | 6.2.1 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **x** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **x** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **x** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

\*\*\*\*\*\*\*\*\*\*\*\*\* Start of 1st Changes \*\*\*\*\*\*\*\*\*\*\*\*\*

### 6.2.1 AAnF response with UE Identity

Figure 6.2-1 shows the procedure used by the AF to request application function specific AKMA keys from the AAnF, when the AF is located inside the operator's network.



Figure 6.2-1: KAF generation from KAKMA

Before communication between the UE and the AKMA AF can start, the UE and the AKMA AF need to know whether to use AKMA. This knowledge is implicit to the specific application on the UE and the AKMA AF or indicated by the AKMA AF to the UE (see clause 6.5).

1. The UE shall generate the AKMA Anchor Key (KAKMA) and the A-KID from the KAUSF before initiating communication with an AKMA Application Function. When the UE initiates communication with the AKMA AF, it shall include the derived A-KID (see clause 6.1) in the Application Session Establishment Request message. The UE may derive KAF before sending the message or afterwards.

2. If the AF does not have an active context associated with the A-KID, then the AF selects the AAnF as defined in clause 6.7, and sends a Naanf\_AKMA\_ApplicationKey\_Get request to AAnF with the A-KID to request the KAF for the UE. The AF also includes its identity (AF\_ID) in the request. If AF wants to receive a notification for AKMA service disabling, the AF shall include AKMA service disable URI in the Naanf\_AKMA\_ApplicationKey\_Get request. Based on the AKMA service disable URI, the AAnF shall create an implicit subscription for the AF for the AAnF to later notify the AF about AKMA service disable as defined in 6.x. Implicit subscription has an expiration time set by operator policy.

AF\_ID consists of the FQDN of the AF and the Ua\* security protocol identifier (see Annex A.4). The latter parameter identifies the security protocol that the AF will use with the UE.

The AAnF shall check whether the AAnF can provide the service to the AF based on the configured local policy or based on the authorization information available in the signalling (i.e., Oauth2.0 token). If it succeeds, the following procedures are executed. Otherwise, the AAnF shall reject the procedure.

The AAnF shall verify whether the subscriber is authorized to use AKMA based on the presence of the UE specific KAKMA key identified by the A-KID.

 If KAKMA is present in AAnF, the AAnF shall continue with step 3.

 If KAKMA is not present in the AAnF, the AAnF shall continue with step 8 with an error response.

3. Once receiving the request from the AF, if the AAnF determines this specific AF needs GPSI, according to its local policy, the AAnF sends a Nudm\_SDM\_Get Request to the UDM to fetch the GPSI of the UE. If the specific AF does not need GPSI, the AAnF shall continue with step 5.

4. The UDM responds with the GPSI of the UE. The AAnF shall store the received GPSI as part of UE’s AKMA context.

5. Once receiving the request from the AF, the AAnF shall send a Nudm\_EventExposure\_Subscribe request to UDM with SUPI to request the RoamingStatusReport from the UDM.

6. The UDM shall send the Nudm\_EventExposure\_Subscribe response to the AAnF with the information of roaming status.

NOTE: Later on, when the roaming status changes, the UDM also sends a notification to the AAnF about the updated roaming information.

7. Once the AAnF receives the roaming status from the UDM, it checks the local policy and determines whether to provide service to the UE. If yes, the AAnF derives the AKMA Application Key (KAF) from KAKMA if it does not already have KAF. The AAnF shall store the KAF expiration time as part of UE’s AKMA context.

When UE is dual registered, the UE is treated as roaming if at least one of the serving PLMNs indicates the UE is roaming.

 The key derivation of KAF shall be performed as specified in Annex A.4.

8. If the AAnF determines to provide AKMA service to the UE, the AAnF sends Naanf\_AKMA\_ApplicationKey\_Get response to the AF with SUPI/GPSI, KAF and the KAF expiration time. Whether to send SUPI or GPSI is determined by AAnF based on the local policy. If the AAnF finds that roaming is not allowed, it shall respond the AF containing a failure indication that roaming is not allowed.

9. The AF sends the Application Session Establishment Response to the UE. If the information in step 8 indicates failure of AKMA key request, the AF shall reject the Application Session Establishment by including a failure cause. Afterwards, UE may trigger a new Application Session Establishment request with the latest A-KID to the AKMA AF if the failure indicates that KAKMA is not present in the AAnF.

\*\*\*\*\*\*\*\*\*\*\*\*\* End of 1st Changes \*\*\*\*\*\*\*\*\*\*\*\*\*