**3GPP TSG-SA3 Meeting #104-e *S3-212683-r3***

**e-meeting, 16 - 27 August 2021**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
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|  |  | **CR** | **1170** | **rev** | 2 | **Current version:** | **.1** |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network | **X** | Core Network |  |

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| ***Title:***  | Editorial Clarifications for Trusted non-3GPP Access using TNGF |
|  |  |
| ***Source to WG:*** | Intel Corporation |
| ***Source to TSG:*** | S3 |
|  |  |
| ***Work item code:*** | TEI16 |  | ***Date:*** | 09 |
|  |  |  |  |  |
| ***Category:*** | A |  | ***Release:*** |  |
|  | *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:*** | For Trusted non-3GPP access using TNAN, TNAN is functionally split into TNAP and TNGF. TNAP acts access point with L2 interface between UE and TNAP. TNAP and TNGF have AAA interface between them. However, figure 7A.2.1-1 gives an impression that L2 end points are between UE and TNGF. Changes proposed are to fix the figure with correct end points for messages between UE<->TNAP , UE<->TNGF.  |
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| ***Summary of change:*** | Correcttion to steps 4,5, 7b, 9b, 9C, 10b, 10c in figure 7A.2.1-1. Deletion of EN in 7A.2.2 |
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| ***Consequences if not approved:*** | Incorrect specifcation. |
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| ***Clauses affected:*** | 7A.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 ...  |
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| ***Other comments:*** |  |
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| ***This CR's revision history:*** |  |

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Start of Changes\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

## 7A.2 Security procedures

### 7A.2.1 Authentication for trusted non-3GPP access

This clause specifies how a UE is authenticated to 5G network via a trusted non-3GPP access network.

This is based on the specified procedure in TS 23.502 [8] clause 4.12a.2.2 "Registration procedure for trusted non-3GPP access". The authentication procedure is similar to the authentication procedure for trusted non-3GPP access defined in clause 7.2.1 with few differences, which are mentioned below:



Figure 7A.2.1-1: Registration \ Authentication and PDU Session establishment for trusted non-3GPP access

0. The UE selects a PLMN and a TNAN for connecting to this PLMN by using the Trusted Non-3GPP Access Network selection procedure specified in TS 23.501 [2] clause 6.3.12. During this procedure, the UE discovers the PLMNs with which the TNAN supports trusted connectivity (e.g. "5G connectivity").

1. A layer-2 connection is established between the UE and the TNAP. In case of IEEE 802.11 [80], this step corresponds to an 802.11 [80] Association. In case of PPP, this step corresponds to a PPP LCP negotiation. In other types of non-3GPP access (e.g. Ethernet), this step may not be required.

2-3. An EAP authentication procedure is initiated. EAP messages shall be encapsulated into layer-2 packets, e.g. into IEEE 802.3/802.1x packets, into IEEE 802.11/802.1x packets, into PPP packets, etc. The UE provides a NAI that triggers the TNAP to send an AAA request to a TNGF. Between the TNAP and TNGF the EAP packets are encapsulated into AAA messages.

4-10. An EAP-5G procedure is executed as specified in clause 7.2.1with the following modifications:

- The EAP-5G packets shall not be encapsulated into IKEv2 packets. The UE shall also include a UE Id in the AN parameters, e.g. a 5G-GUTI if available from a prior registration to the same PLMN.

- A KTNGF as specified in clause Annex A.9 (equivalentto KN3IWF) is created in the UE and in the AMF after the successful authentication. The KTNGF is transferred from the AMF to TNGF in step 10a (within the N2 Initial Context Setup Request).

- The TNAP is a trusted entity. The TNGF shall generate the KTNAP as specified in Annex A.22 and transfers it from TNGF to TNAP in step 10b (within an AAA message).

- After receiving the TNGF key from AMF in step 10a, the TNGF shall send to UE an EAP-Request/5G-Notification packet containing the "TNGF Contact Info", which includes the IP address of TNGF. After receiving an EAP-Response/5G-Notification packet from the UE, the TNGF shall send message 10b containing the EAP-Success packet.

11. The common TNAP key is used by the UE and TNAP to derive security keys according to the applied non-3GPP technology and to establish a security association to protect all subsequent traffic. In case of IEEE 802.11 [80], the KTNAP is the Pairwise Master Key (PMK) and a 4-way handshake is executed (see IEEE 802.11 [80]) which establishes a security context between the WLAN AP and the UE that is used to protect unicast and multicast traffic over the air. All messages between UE and TNAP are encrypted and integrity protected from this step onwards.

NOTE 1: whether step 11 is performed out of the scope of this document. The current procedure assumes the encryption protection over Layer-2 between UE and TNAP is to be enabled.

12. The UE receives IP configuration from the TNAN, e.g. with DHCP.

13. The UE shall initiate an IKE\_INIT exchange with the TNGF. The UE has received the IP address of TNGF during the EAP-5G signalling in step 9b, subsequently, the UE shall initiate an IKE\_AUTH exchange andshall include the same UE Id (i.e. SUCI or 5G-GUTI) as in the UE Id provided in step 5. The common KTIPSe is used for mutual authentication. The key KTIPSec is derived as specified in Annex A.22.NULL encryption is negotiated as specified in RFC 2410 [81]. After step 13c, an IPsec SA is established between the UE and TNGF (i.e. a NWt connection) and it is used to transfer all subsequent NAS messages. This IPsec SA does not apply encryption but only apply integrity protection.

14. After the NWtp connection is successfully established, the TNGF responds to AMF with an N2 Initial Context Setup Response message.

15. Finally, the NAS Registration Accept message is sent by the AMF and is forwarded to UE via the established NWt connection.

16-18. The UE initiates a PDU session establishment. This is carried out exactly as specified in TS 23.502 [8] clause 4.12a.5. The TNGF may establish one or more IPSec child SA’s per PDU session.

19. User plane data for the established PDU session is transported between the UE and TNGF inside the established IPSec child SA.

### 7A.2.2 Void

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