**3GPP TSG-CT WG1 Meeting #125-eC1-205xxx**

**Electronic meeting, 20-28 August 2020**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
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|  | **24.501** | **CR** | **2579** | **rev** | **1** | **Current version:** | **16.5.1** |  |
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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 |  | Core Network |  |

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| ***Title:***  | Deleting 5G NAS security context when 5G-EA0 used and PLMN changed |
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| ***Source to WG:*** | Huawei, HiSilicon |
| ***Source to TSG:*** | C1 |
|  |  |
| ***Work item code:*** | 5GProtoc17 |  | ***Date:*** | 2020-07-30 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | Rel-17 |
|  | *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-12 (Release 12)**Rel-13 (Release 13)Rel-14 (Release 14)Rel-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)* |
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| ***Reason for change:*** | It was specified the following handling for protection of initial NAS signalling messages in sub 4.4.6:"*If the UE registered in a PLMN:**a) has 5G-EA0 as a selected 5G NAS security algorithm; and**b) selects a PLMN other than registered PLMN and EPLMN;**the UE shall discard the 5G NAS security context and send an initial NAS message including cleartext IEs only as described in this subclause for the case when the UE does not have a valid 5G NAS security context.*"The text “*discard the 5G NAS security context*” is a little confusing from the UE implementation perspective. Actually the UE has already stored the current valid 5G NAS security context before entering above case. Hence, how can the UE “discard” something which has already stored? Normally we said the UE will “discard” the received NAS message without storing it but not say to “discard” something which was already stored. Furthermore, the text “*discard the 5G NAS security context*” was only used once in the whole TS 24.501. It is often to use “*delete the 5G NAS security context*” in the TS 24.501. |
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| ***Summary of change:*** | It proposes to change “*discard the 5G NAS security context*” to “*delete the 5G NAS security context*” in the TS 24.501. |
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| ***Consequences if not approved:*** | The text “*discard the 5G NAS security context*” is confusing and not aligned with other text in TS 24.501 for the same thing. |
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| ***Clauses affected:*** | 4.4.6 |
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|  | **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:*** |  |

\* \* \* First Change \* \* \* \*

### 4.4.6 Protection of initial NAS signalling messages

The 5GS supports protection of initial NAS messages as specified in 3GPP TS 33.501 [24]. The protection of initial NAS messages applies to the REGISTRATION REQUEST, SERVICE REQUEST and CONTROL PLANE SERVICE REQUEST message, and is achieved as follows:

a) If the UE does not have a valid 5G NAS security context, the UE sends a REGISTRATION REQUEST message including cleartext IEs only. After activating a 5G NAS security context resulting from a security mode control procedure:

1) if the UE needs to send non-cleartext IEs, the UE shall include the entire REGISTRATION REQUEST message (i.e. containing both cleartext IEs and non-cleartext IEs) in the NAS message container IE and shall include the NAS message container IE in the SECURITY MODE COMPLETE message; or

2) if the UE does not need to send non-cleartext IEs, the UE shall include the entire REGISTRATION REQUEST message (i.e. containing cleartext IEs only) in the NAS message container IE and shall include the NAS message container IE in the SECURITY MODE COMPLETE message.

b) If the UE has a valid 5G NAS security context and:

1) the UE needs to send non-cleartext IEs in a REGISTRATION REQUEST or SERVICE REQUEST message, the UE includes the entire REGISTRATION REQUEST or SERVICE REQUEST message (i.e. containing both cleartext IEs and non-cleartext IEs) in the NAS message container IE and shall cipher the value part of the NAS message container IE. The UE shall then send a REGISTRATION REQUEST or SERVICE REQUEST message containing the cleartext IEs and the NAS message container IE;

2) the UE needs to send non-cleartext IEs in a CONTROL PLANE SERVICE REQUEST message:

i) if CIoT small data container IE is the only non-cleartext IE to be sent, the UE shall cipher the value part of the CIoT small data container IE. The UE shall then send a CONTROL PLANE SERVICE REQUEST message containing the cleartext IEs and the CIoT small data container IE;

ii) otherwise, the UE includes non-cleartext IEs in the NAS message container IE and shall cipher the value part of the NAS message container IE. The UE shall then send a CONTROL PLANE SERVICE REQUEST message containing the cleartext IEs and the NAS message container IE; or

3) the UE does not need to send non-cleartext IEs in a REGISTRATION REQUEST or SERVICE REQUEST or CONTROL PLANE SERVICE REQUEST message, the UE sends the REGISTRATION REQUEST or SERVICE REQUEST or CONTROL PLANE SERVICE REQUEST message without including the NAS message container IE.

When the initial NAS message is a REGISTRATION REQUEST message, the cleartext IEs are:

- Extended protocol discriminator;

- Security header type;

- Spare half octet;

- Registration request message identity;

- 5GS registration type;

- ngKSI;

- 5GS mobile identity;

- UE security capability;

- Additional GUTI;

- UE status; and

- EPS NAS message container.

When the initial NAS message is a SERVICE REQUEST message, the cleartext IEs are:

- Extended protocol discriminator;

- Security header type;

- Spare half octet;

- ngKSI;

- Service request message identity;

- Service type; and

- 5G-S-TMSI.

When the initial NAS message is a CONTROL PLANE SERVICE REQUEST message, the cleartext IEs are:

- Extended protocol discriminator;

- Security header type;

- Spare half octet;

- ngKSI;

- Control plane service request message identity; and

- Control plane service type.

When the UE sends a REGISTRATION REQUEST or SERVICE REQUEST or CONTROL PLANE SERVICE REQUEST message that includes a NAS message container IE, the UE shall set the security header type of the initial NAS message to "integrity protected".

If the UE does not need to send non-cleartext IEs in the initial NAS message, the UE shall send the initial NAS message i.e. REGISTRATION REQUEST or SERVICE REQUEST or CONTROL PLANE SERVICE REQUEST message with cleartext IEs only i.e. without including the NAS message container IE in the initial NAS message.

When the AMF receives an integrity protected initial NAS message which includes a NAS message container IE, the AMF shall decipher the value part of the NAS message container IE. If the received initial NAS message is a REGISTRATION REQUEST message or a SERVICE REQUEST message, the AMF shall consider the NAS message that is obtained from the NAS message container IE as the initial NAS message that triggered the procedure.

When the AMF receives a CONTROL PLANE SERVICE REQUEST message which includes a CIoT small data container IE, the AMF shall decipher the value part of the CIoT small data container IE and handle the message as specified in subclause 5.6.1.4.2.

When the initial NAS message is a DEREGISTRATION REQUEST message, the UE always sends the NAS message unciphered.

If the UE registered in a PLMN:

a) has 5G-EA0 as a selected 5G NAS security algorithm; and

b) selects a PLMN other than registered PLMN and EPLMN;

the UE shall delete the 5G NAS security context and send an initial NAS message including cleartext IEs only as described in this subclause for the case when the UE does not have a valid 5G NAS security context.

\* \* \* End of Change \* \* \* \*