**3GPP TSG-SA3 Meeting #99e *S3-201106***

**e-meeting, 11 – 15 May 2020**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
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|  | **33.512** | **CR** | 0007 | **rev** |  | **Current version:** | **16.2.0** |  |
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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 |  | Radio Access Network |  | Core Network | **X** |

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| ***Title:***  | Clarification on the test case on RES\* verification failure handling |
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| ***Source to WG:*** | Huawei, Hisilicon |
| ***Source to TSG:*** | S3 |
|  |  |
| ***Work item code:*** | SCAS\_5G |  | ***Date:*** | 4/27/2020 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | Rel-16 |
|  | *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)* |
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| ***Reason for change:*** | The test case curently put in clause 4.2.2.1.2 on RES\* verification failure handling does not support the referenced security requirement.The security requirement states that in the case of RES\* verifiation failure:* the SEAF shall send an Authentication Reject to the UE if SUCI was used by the UE in the initial NAS; or
* the SEAF shall initiate an Identification procedure with the UE if the 5G-GUTI was used by the UE in the intial NAS message

The exceution steps currently phrased in clause 4.2.2.1.2 does not specify the prerequisite step where UE sends a initial NAS with either SUCI or 5G-GUTI. With the lack of this step, the SEAF undertest cannot perform what needs to be tested.Also, the descriptions in step 2) of Test Case 1 and 2 in 4.2.2.1.2 are incorrect, because according to 29.509, the SEAF/AMF, after the comparion of HRES\* and HXRES\* fails, will send neither the received RES\* nor SUCI/SUPI to the AUSF, according to 29.509. Instead, the SEAM/AMF shall send a null value for RES\*. |
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| ***Summary of change:*** | The following modifications are made:1. Add the prerequisite step where UE sends a initial NAS with its identity (SUCI or 5G-GUTI).
2. After the RES\* verification fails in the SEAF, SEAF shall either reject the authentication or initiate an identifiction procedure, as specified by the requirement.
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| ***Consequences if not approved:*** | Missing prerequisite step in the testMisalignment with the specification |
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| ***Clauses affected:*** | 4.2.2.1.2 |
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|  | **Y** | **N** |  |  |
| ***Other specs*** |  |  |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  |  |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  |  |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

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

##### 4.2.2.1.2 RES\* verification failure handling

*Requirement Name*: RES\* verification failure handling

*Requirement Reference:* TS 33.501 [2], clause 6.1.3.2.2

*Requirement Description*:

"The SEAF shall proceed with step 10 in Figure 6.1.3.2-1 and after receiving the Nausf\_UEAuthentication\_Authenticate Request message from the AUSF in step 12 in Figure 6.1.3.2-1, proceed as described below:

- if the AUSF has indicated in the Nausf\_UEAuthentication\_Authenticate Response message to the SEAF that the verification of the RES\* was not successful in the AUSF, or

- if the verification of the RES\* was not successful in the SEAF,

then the SEAF shall either reject the authentication by sending an Authentication Reject to the UE if the SUCI was used by the UE in the initial NAS message or the SEAF/AMF shall initiate an Identification procedure with the UE if the 5G-GUTI was used by the UE in the initial NAS message to retrieve the SUCI and an additional authentication attempt may be initiated.

Also, if the SEAF does not receive any Nausf\_UEAuthentication\_Authenticate Request message from the AUSF as expected, then the SEAF shall either reject the authentication to the UE or initiate an Identification procedure with the UE."

As specified in TS 33.501 [2], clause 6.1.3.2.2.

*Threat References*: TR 33.926 [6], clause K.2.2.3, RES\* verification failure

*Test Case*:

**Test Name:** TC\_RES\*\_VERIFICATION\_FAILURE

**Purpose:**

1) Verify that the SEAF/AMF correctly handles RES\* verification failure detected in the SEAF/AMF or/and in the AUSF, when the SUCI is included in the initial NAS message.

2) Verify that the SEAF/AMF correctly handles RES\* verification failure detected in the SEAF/AMF or/and in the AUSF, when the 5G-GUTI is included in the initial NAS message.

**Procedure and execution steps:**

**Pre-Conditions:**

Test environment with UE and AUSF. The UE and the AUSF may be simulated.

**Execution Steps**

A. Test Case 1

1) The UE sends RR with SUCI to the SEAF/AMF under test, to trigger the SEAF/AMF under test to initiate the authentication, i.e. to send Nausf\_UEAuthentication\_Authenticate Request to the AUSF.

2) The AUSF, after receiving the request from the SEAF/AMF under test, responds with a Nausf\_UEAuthentication\_Authenticate Response message with an authentication vector to the SEAF/AMF under test.

3) The UE, after receiving the Authentication Request message from the SEAF/AMF under test, returns an incorrect RES\* to the SEAF/AMF under test in the NAS Authentication Response message, which will trigger the AMF to compute HRES\*, compare HRES\* with HXRES\* and send an authentication request to the AUSF a NULL value for RES\*.

4) The AUSF returns to the AMF under test the indication of RES\* verification failure.

B. Test Case 2

1) The UE sends RR with a 5G-GUTI to the SEAF/AMF under test, to trigger the SEAF/AMF under test to initiate the authentication, i.e. to send Nausf\_UEAuthentication\_Authenticate Request to the AUSF.

2) The AUSF, after receiving the request from the SEAF/AMF under test, responds with a Nausf\_UEAuthentication\_Authenticate Response message with an authentication vector to the SEAF/AMF under test.

3) The UE, after receiving the Authentication Request message from the SEAF/AMF under test, returns an incorrect RES\* to the SEAF/AMF under test in the NAS Authentication Response message, which will trigger the AMF to compute HRES\* and compare HRES\* with HXRES\*, and send an authentication request to the AUSF a NULL value for RES\*.

4) The AUSF returns to the AMF under test an indication of RES\* verification failure.

C. Test Case 3

1) The UE sends RR with SUCI to the SEAF/AMF under test, to trigger the SEAF/AMF under test to initiate the authentication, i.e. to send Nausf\_UEAuthentication\_Authenticate Request to the AUSF.

2) The AUSF, after receiving the request from the SEAF/AMF under test, responds with a Nausf\_UEAuthentication\_Authenticate Response message with an authentication vector to the SEAF/AMF under test.

3) The UE returns RES\* to the SEAF/AMF under test in the NAS Authentication Response message, which will trigger the AMF to compute HRES\*, compare HRES\* with HXRES\*, and send to the received RES\* to the AUSF.

4) The AUSF returns to the AMF under test an indication of RES\* verification failure.

D Test Case 4

1) The UE sends RR with 5G-GUTI to the SEAF/AMF under test, to trigger the SEAF/AMF under test to initiate the authentication, i.e. to send Nausf\_UEAuthentication\_Authenticate Request to the AUSF.

2) The AUSF, after receiving the request from the SEAF/AMF under test, responds with a Nausf\_UEAuthentication\_Authenticate Response message with an authentication vector to the SEAF/AMF under test.

3) The UE returns RES\* to the SEAF/AMF under test in the NAS Authentication Response message, which will trigger the AMF to compute HRES\*, compare HRES\* with HXRES\*, and send to the received RES\* to the AUSF.

4) The AUSF returns to the AMF under test an indication of RES\* verification failure.

**Expected Results:**

For test case 1 and 3, the SEAF/AMF rejects the authentication by sending an Authentication Reject to the UE.

For test case 2 and 4, the SEAF/AMF initiates an Identification procedure with the UE to retrieve the SUCI.

**Expected format of evidence:**

Evidence suitable for the interface, e.g., Screenshot containing the operational results.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* End of Changes \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*