**3GPP TSG-SA3 Meeting #111 *S3-23xxxx***

**Berlin, Germany, 22 -26 May 2023**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **33.512** | **CR** | **<CR#>** | **rev** | **<Rev#>** | **Current version:** | **17.3.0** |  |
|  | | | | | | | | |
| *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 of NAS integrity algorithm selection and use | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Federal Office for Information Security (BSI) | | | | | | | | | |
| ***Source to TSG:*** | S3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | eSCAS\_5G | | | | |  | ***Date:*** | | | 2023-05-08 |
|  |  | | | |  | |  | | |  |
| ***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 can be 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:*** | | The current test does not check whether the actually configured ordered list of algorithms is chosen or there simply is a hardcoded ordered list used by the AMF. | | | | | | | | |
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| ***Summary of change:*** | | Added tester ability to change ordered list of algorithms to pre conditions.  Added test step to actually manipulate the ordered list of algorithms. | | | | | | | | |
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| ***Consequences if not approved:*** | | In a real-world deployment, the ordered list of algorithms can be altered by the MNO. The current test only checks for the default order that could be hardcoded in the AMF. This could lead to the use of the wrong integrity protection or ciphering algorithm. | | | | | | | | |
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| ***Clauses affected:*** | | 4.2.2.3.3 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 CHANGE \*\*\*\*\*\*\*\*\*\*

##### 4.2.2.3.3 NAS integrity algorithm selection and use

*Requirement Name*: NAS integrity algorithm selection and use

*Requirement Reference:* TS 33.501 [7], clause 6.7.1

*Requirement Description*: "The AMF shall then initiate a NAS security mode command procedure, and include the chosen algorithm and UE security capabilities (to detect modification of the UE security capabilities by an attacker) in the message to the UE (see sub-clause 6.7.2 of the present document). The AMF shall select the NAS algorithm which have the highest priority according to the ordered lists." as specified in TS 33.501 [7], clause 5.5.2.

*Threat References*: TR 33.926 [6], clause K.2.3.2, NAS integrity selection and use

*Test Case:*

**Test Name:** TC\_NAS\_INT\_SELECTION\_USE\_AMF

**Purpose:**

Verify that the AMF selects the NAS integrity algorithm which has the highest priority according to the ordered list of supported integrity algorithms and is contained in the 5G security capabilities supported by the UE.

Verify that the selected NAS security algorithm is being used.

**Pre-Conditions:**

- Test environment with a UE containing its 5G security capabilities, AUSF and UDM. The UE, AUSF and UDM may be simulated.

- The list of ordered NAS integrity algorithms are configured on the AMF under test.

- The tester is able to configure the list of ordered NAS integrity algorithms on the AMF under test.

**Execution Steps:**

1) The UE sends a Registration Request with Initial Registration type to the AMF under test.

2) The tester filters the Security Mode Command and Security Mode Complete messages.

3) The tester examines the selected integrity algorithm in the SMC against the list of ordered NAS integrity algorithm and the 5G security capabilities supported by the UE. The tester examines the MAC verification of the Security Mode Complete at the AMF under test.

4) The tester changes the default order of the list of ordered NAS integrity algorithms on the AMF to another valid configuration and repeats step 1-3.

**Expected Results:**

The selected integrity algorithm has the highest priority according to the list of ordered NAS integrity algorithm and is contained in the UE 5G security capabilities.

The MAC verification of the Security Mode Complete message is successful.

**Expected format of evidence:**

Logs and communication flow saved in a .pcap file.

\*\*\*\*\*\*\*\*\*\* END OF CHANGE \*\*\*\*\*\*\*\*\*\*