**3GPP TSG-SA3 Meeting #116 *S3-241783***

Jeju, Korea (Republic Of), 20th May 2024 - 24th May 2024

**Source: BSI (DE)**

**Title: Add specific UDR SCAS test cases for TS 33.530**

**Document for: Approval**

**Agenda Item: 4.2**

# 1 Decision/action requested

***This contribution proposes UDR-specific SCAS test cases for the authentication status.***

# 2 References

[1] 3GPP TS 33.530 Security Assurance Specification (SCAS) for the Unified Data Repository (UDR) v0.1.0

[2] 3GPP TS 33.117: "Catalogue of general security assurance requirements"

# 3 Rationale

This contribution proposes UDR-specific test cases related to security functional requirements of the UDR to draft TS [1] chapter 4.

These two test cases arrive from the requirements described in S3-241784 and S3-241785 and the added threat references in S3-241786. It can be argued that these test cases, much like the requirements and threats, are inherited from the UDM test cases. The UDM can use the UDR as a repository function for storing data. In these cases, the UDR must work correctly with respect to the requirements. During AKA, the UDR fulfills a critical role in updating the sequence number, but also in storing the authentication status of the UE.

It must be clearly stated that these test cases are security related test cases. If the UE does not meet the requirements for storing the authentication status or updating the authentication data correctly, itmay have severe security implications. For example, failure to update the sequence number can lead to a denial of service in the event of a synchronization failure. In the case where the authentication status is not stored correctly, it will allow attacks to bypass the increased home control.

# 4 Detailed proposal

It is proposed that SA3 approve the below changes for inclusion in the TS [1].

\*\*\*\*\*\*\*\*\*\* START OF 1st CHANGE \*\*\*\*\*\*\*\*\*\*

2 References

[2] 3GPP TS 33.117: "Catalogue of general security assurance requirements"

[3] 3GPP TS 23.501: "System Architecture for 5G System (5GS)".

[4] 3GPP TS 33.501: "Security architecture and procedures for 5G system"

[5] 3GPP TR 33.926: "Security Assurance Specification (SCAS) threats and critical assets in 3GPP

 network product classes".

[6] 3GPP TS 29.504: “5G; 5G System; Unified Data Repository Services; Stage 3”

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

\*\*\*\*\*\*\*\*\*\* START OF 2nd CHANGE \*\*\*\*\*\*\*\*\*\*

## 4.2 UDR-specific adaptations of security functional requirements and related test cases

## 4.2.1 Authentication and key agreement procedure

### 4.2.1.1 Patch authentication data

*Requirement Name:* Failure to update UE security information

*Requirement Reference:* TS 33.501 [4], clause 5.8b Requirements on the UDR

*Threat References:* TR 33.926 [5], clause AA 2.2.1 Failure to store and delete authentication status

*Requirement Description*: The UDR shall udpate the security relevant data of the UE.

Test Case:

Test Name: TC\_VERIFY\_UPDATE\_SQN\_UDR

Purpose:

- Verify that the UDR under test updated the SQN correctly.

Procedure and execution steps:

Pre-Condition:

- The UE needs to be registered in the network

- The tester shall have access to the UE credentials

- The UDM might be simulated

**Execution Steps:**

**-** The tester obtains the authentication data from the UDR of a UE.

- The tester updates the SQN of that UE to a new value at the UDR.

- The tester obtains the authentication data from the UDR of the UE.

Expected Result:

The authentication data from the last request contains the updated SQN.

**Expected format of evidence:**

Suitable evidence for the interface could include a packet trace, such as a pcap file.

### 4.2.1.2 Storing of authentication status of UE by UDR

*Requirement Name*: Storing of authentication status of UE by UDR.

*Requirement Reference:* TS 33.501 [4], clause 5.8b Requirements on the UDR

*Threat References:* TR 33.926 [5], clause AA 2.2.2 Failure to store and delete authentication status

*Requirement Description*: The UDR shall store the security relevant data of the UE.

Test Case:

Test Name: TC\_PUT\_GET\_DEL\_STATUS\_UDR

Purpose:

- Verify that the UDR under test stores the authentication status of UE.

Procedure and execution steps:

Pre-Condition:

- The UE needs to be registered in the network

- The tester shall have access to the UE credentials

- The tester knows if UDR supports the feature PerUePerSnAuthStatus as defined in TS 29.504 [6] clause 6.1.8 Feature negotiation.

**Execution Steps:**

**Applicability: Test C and D only apply if the UDR supports the PerUePerSnAuthStatus TS 29.504 6.1.8 Feature negotiation**

Test A:

- The tester stores the authentication status data of a UE in the UDR.

- The tester tries to retrieve the authentication status of the UE from the UDR.

Test B:

- The tester stores the authentication status data of a UE in the UDR.

- The tester retrieves the authentication status of the UE from the UDR.

- The tester deletes the authentication status data of the UE in the UDR.

- The tester tries to retrieve the authentication status of the UE from the UDR.

Test C:

- The tester stores the individual authentication status data of a UE in the UDR for a specific serving network

- The tester tries to retrieve the individual authentication status of the UE from the UDR.

Test D:

- The tester stores the individual authentication status data of a UE in the UDR for a specific serving network (IndividualAuthenticationStatus of TS 29.505)

- The tester retrieves the individual authentication status of the UE from the UDR.

- The tester deletes the individual authentication status data of the UE in the UDR.

- The tester tries to retrieve the individual authentication status of the UE from the UDR.

Expected Results:

- For test cases A and C, the tester retrieves the same authentication status as sent.

- For test case B, the tester does not obtain the authentication status from the UDR.

- For test case D, the tester does not obtain the individual authentication status from the UDR.

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