**3GPP TSG-CT4 Meeting #101-e C4-205xxx**

**E-Meeting, 3rd Nov 2020 - 13th Nov 2020 Revision of C4-205113**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **29.509** | **CR** | **0108** | **rev** | **2** | **Current version:** | **16.5.0** |  |
|  | | | | | | | | |
| *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:*** | Evolution of SoR delivery mechanism – AUSF API Changes | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Samsung | | | | | | | | | |
| ***Source to TSG:*** | CT4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | eCPSOR\_CON-CT | | | | |  | ***Date:*** | | | 2020-11-04 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **C** |  | | | | | ***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)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | As detailed in Discussion Paper C4-205111, this CR proposes to modify the encoding of *SorInfo* attribute so that AUSF need not bother aboout contents of the SoR Information while protecting the same using Nausf\_SoRProtection Service. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | *SorInfo* attribute is modified to include *SorHeader and SoRTransparentInfo* attributes. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Requires software changes to AUSF if extended SoR information needs to be sent. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 2, 5.3.2.2.1, 6.2.6.1, 6.2.6.2.2, 6.2.6.3.2, 6.2.X, A.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 makes Backward Compatible Changes to OpenAPI file for Nausf\_SoRProtection API | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | Rev1: a) Changed WI from SBIProtoc17 to eCPSOR\_CON-CT  b) Added changes to clause 5.3.2.2.1  c) Added conditions to presence of new attributes SorHeader and SorTransparentInfo  Rev2: Added Feature Negotiation for Nausf\_SoRProtection API | | | | | | | | |

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

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 23.501: "System Architecture for the 5G System; Stage 2".

[3] 3GPP TS 23.502: "Procedures for the 5G System; Stage 2".

[4] 3GPP TS 29.500: "5G System; Technical Realization of Service Based Architecture; Stage 3".

[5] 3GPP TS 29.501: "5G System; Principles and Guidelines for Services Definition; Stage 3".

[6] IETF RFC 7540: "Hypertext Transfer Protocol Version 2 (HTTP/2)".

[7] IETF RFC 8259: "The JavaScript Object Notation (JSON) Data Interchange Format".

[8] 3GPP TS 33.501: "Security Architecture and Procedures for 5G System".

[9] IETF RFC 5448: "Improved Extensible Authentication Protocol Method for 3rd Generation Authentication and Key Agreement (EAP-AKA')".

Editor's Note: This reference may be removed and references to it updated when the IETF publishes the corresponding update version.

[10] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces; Stage 3".

[11] IETF RFC 7807: "Problem Details for HTTP APIs".

[12] 3GPP TS 29.503: "5G System; Unified Data Management Services; Stage 3".

[13] IETF RFC 6749: "The OAuth 2.0 Authorization Framework".

[14] 3GPP TS 29.510: "Network Function Repository Services; Stage 3".

[15] 3GPP TS 31.102: "Characteristics of the Universal Subscriber Identity Module (USIM) application".

[16] IETF RFC 5216: "The EAP-TLS Authentication Protocol".

[17] Internet draft draft-ietf-emu-rfc5448bis: "Improved Extensible Authentication Protocol Method for 3rd Generation Authentication and Key Agreement (EAP-AKA')".

[18] IETF RFC 3748: "Extensible Authentication Protocol (EAP)".

[19] IETF RFC 4648: "The Base16, Base32 and Base64 Data Encodings".

[20] 3GPP TS 24.501: "Non-Access-Stratum (NAS) protocol for 5G System (5GS); Stage 3".

[21] 3GPP TR 21.900: "Technical Specification Group working methods".

[22] 3GPP TS 29.544: "5G System; SP-AF Services; Stage 3".

[23] 3GPP TS 23.316: " Wireless and wireline convergence access support for the 5G System (5GS); Release 16".

[24] 3GPP TS 29.524: "5G System; Cause codes mapping between 5GC interfaces; Stage 3".

[XX] OpenAPI Initiative, "OpenAPI 3.0.0 Specification", <https://github.com/OAI/OpenAPI-Specification/blob/master/versions/3.0.0.md>

\* \* \* Next Change \* \* \* \*

##### 5.3.2.2.1 General

The Protect service operation is used in the following procedures:

- Procedure for steering of UE in VPLMN during registration (see clause 6.14.2.1 of 3GPP TS 33.501 [8]);

- Procedure for steering of UE in VPLMN after registration (see clause 6.14.2.2 of 3GPP TS 33.501 [8]).

The NF Service Consumer (e.g. UDM) uses this service operation to request the AUSF to compute the SoR-MAC-IAUSF and the CounterSoR by providing Steering Information. The NF Service Consumer (e.g. UDM) may also request the AUSF to compute the SoR-XMAC-IUE by providing the indication that an acknowledgement is requested from the UE.



Figure 5.3.2.2.1-1: Steering of UE in VPLMN

1. The NF Service Consumer (e.g. UDM) shall send a POST request to the AUSF that was used to authenticate the UE. The payload of the body shall contain the Steering Information and the acknowledge indication.

2a. On success, "200 OK" shall be returned. The payload body shall contain the requested security material (e.g. SoR-MAC-IAUSF,CounterSoR,SoR-XMAC-IUE) necessary to protect the Steering of Roaming procedure.

SoR Header shall be used to form the input as one of multiple paramters to calculate the SoR-MAC-IAUSF. If SoRHeader attribute is not provided by NF Service Consumer (e.g. UDM) as part of SorInfo, SoR Header shall be constructed by AUSF based on the information received in the request and encoded as specified in clasue 9.11.3.51 of 3GPP TS 24.501[20].

2b. On failure, one of the HTTP status code listed in table 6.2.7.3-1 shall be returned with the message body containing a ProblemDetails structure with the "cause" attribute set to one of the application error listed in Table 6.2.7.3-1. If the CounterSoR associated with the KAUSF of the UE, is about to wrap around, the AUSF shall use the "COUNTER-WRAP" cause.

\* \* \* Next Change \* \* \* \*

#### 6.2.6.1 General

This clause specifies the application data model supported by the API.

Table 6.2.6.1-1 specifies the data types defined for the Nausf-SORProtection service based interface protocol.

Table 6.x.6.1-1: Nausf specific Data Types

|  |  |  |
| --- | --- | --- |
| Data type | Clause defined | Description |
| SorInfo | 6.2.6.2.2 | Contains the Steering Information |
| SorSecurityInfo | 6.2.6.2.3 | Contains the material generated for securing of SoR. It contains at least the SoR-MAC-IAUSF and CounterSoR. |
| SteeringInfo | 6.2.6.2.4 | Contains a combination of one PLMN identity and zero or more access technologies. |
| SteeringContainer | 6.2.6.2.5 |  |
| SorMac | 6.2.6.3.2 | MAC value for protecting SOR procedure (SoR-MAC-IAUSF and SoR-XMAC-IUE) |
| CounterSor | 6.2.6.3.2 | CounterSoR |
| AckInd | 6.2.6.3.2 | Contains indication whether the acknowledgement from UE is needed |
| SecuredPacket | 6.2.6.3.2 |  |
| AccessTech | 6.2.6.3.3 | Access Technology |
| SorHeader | 6.2.6.3.2 |  |
| SorTransparentInfo | 6.2.6.3.2 |  |

Table 6.2.6.1-2 specifies data types re-used by the Nausf-SORProtection service based interface protocol from other specifications, including a reference to their respective specifications and when needed, a short description of their use within the Nausf service based interface.

Table 6.2.6.1-2: Nausf re-used Data Types

|  |  |  |
| --- | --- | --- |
| Data type | Reference | Comments |
| PlmnId | 3GPP TS 29.571 [10] | PLMN ID |

\* \* \* Next Change \* \* \* \*

##### 6.2.6.2.2 Type: SorInfo

Table 6.2.6.2.2-1: Definition of type SorInfo

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description |
| ackInd | AckInd | M | 1 | Contains the indication whether the acknowledgement from UE is needed. |
| steeringContainer | SteeringContainer | C | 0..1 | When present, this information contains the information needed to update the "Operator Controlled PLMN Selector with Access Technology" list stored in the USIM.  It may contain an array of preferred PLMN/AccessTechnologies combinations in priority order. The first entry in the array indicates the highest priority and the last entry indicates the lowest.  Or it may contain a secured packet.  If no change of the "Operator Controlled PLMN Selector with Access Technology" list stored in the USIM is needed then this attribute shall be absent.  Shall be absent if sorTransparentInfo is present. |
| sorHeader | SorHeader | O | 0..1 | This attribute contains SoR Header encoded as defined in clause 6.2.6.3.2 and shall be present if AUSF supports receiving SoR Information encoded as transparent containers. |
| sorTransparentInfo | SorTransparentInfo | O | 0..1 | This attribute contains steering information encoded as defined in clause 6.2.6.3.2, and may be present if AUSF supports receiving SoR Information encoded as transparent containers.  It may be absent if no change of the "Operator Controlled PLMN Selector with Access Technology" list stored in the USIM is needed. |

\* \* \* Next Change \* \* \* \*

##### 6.2.6.3.2 Simple data types

Table 6.2.6.3.2-1: Simple data types

|  |  |  |
| --- | --- | --- |
| Type Name | Type Definition | Description |
| SorMac | String | pattern: "^[A-Fa-f0-9]{32}$" |
| CounterSor | String | pattern: "^[A-Fa-f0-9]{4}$" |
| AckInd | Boolean | true indicates that the SoR-XMAC-IUE shall be computed and returned in the response |
| SecuredPacket | String | Contains a secure packet as specified in 3GPP TS 24.501 [20]. It is encoded using base64 and represented as a String.  Format: base64 |
| SorHeader | Bytes | String with format "byte" as defined in OpenAPI Specification [XX], i.e. base64-encoded characters, encoding the "SOR Header" IE as specified in clause 9.11.3.51 of 3GPP TS 24.501 [20] (octet 4). |
| SorTransparentInfo | Bytes | String with format "byte" as defined in OpenAPI Specification [XX], i.e. base64-encoded characters, encoding the "SOR transparent container" IE as specified in clause 9.11.3.51 of 3GPP TS 24.501 [20] (starting from octet 23). |

\* \* \* Next Change \* \* \* \*

### 6.2.X Feature Negotiation

The optional features in table 6.2.x-1 are defined for the Nausf\_SoRProtection API. They shall be negotiated using the extensibility mechanism defined in clause 6.6 of 3GPP TS 29.500 [4].

Table 6.2.X-1: Supported Features

|  |  |  |
| --- | --- | --- |
| Feature number | Feature Name | Description |
| x | sorTransparentSupport | This flag is used by AUSF to register (in NRF) its support of receiving SoR Transparent Information instead of individual IEs from UDM. |

\* \* \* Next Change \* \* \* \*

## A.3 Nausf\_SoRProtection API

openapi: 3.0.0

info:

version: 1.1.1

title: Nausf\_SoRProtection Service

description: |

AUSF SoR Protection Service.

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\*\*\*\*\*\*\*\*skipped for clarity\*\*\*\*\*\*\*\*

# COMPLEX TYPES:

#

SorInfo:

type: object

properties:

steeringContainer:

$ref: '#/components/schemas/SteeringContainer'

ackInd:

$ref: '#/components/schemas/AckInd'

sorHeader:

$ref: '#/components/schemas/SorHeader'

sorTransparentInfo:

$ref: '#/components/schemas/SorTransparentInfo'

required:

- ackInd

\*\*\*\*\*\*\*\*skipped for clarity\*\*\*\*\*\*\*\*

# SIMPLE TYPES:

#

SorMac:

type: string

pattern: '^[A-Fa-f0-9]{32}$'

CounterSor:

type: string

pattern: '^[A-Fa-f0-9]{4}$'

AckInd:

type: boolean

SecuredPacket:

type: string

format: base64

SorHeader:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Bytes'

SorTransparentInfo:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Bytes'

\*\*\*\*\*\*\*\*skipped for clarity\*\*\*\*\*\*\*\*

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