**3GPP TSG-CT WG1 Meeting #137-eC1-22xxxx**

**E-Meeting, 18th – 26th August 2022**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **24.501** | **CR** | **4615** | **rev** | **1** | **Current version:** | **17.7.1** |  |
|  | | | | | | | | |
| *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 | **X** |

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| ***Title:*** | Some corrections related to the Relay Key Request procedure | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Nokia, Nokia Shanghai Bell, Ericsson, ZTE | | | | | | | | | |
| ***Source to TSG:*** | C1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5G\_ProSe | | | | |  | ***Date:*** | | | 2022-07-04 |
|  |  | | | |  | |  | | |  |
| ***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)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | The following corrections need to be done for the Relay Key Request procedure used for the authentication of the UE-to-network relay:  1- Multiple references are indicated as 9.11.3.aa, 9.11.3.bb and 9.11.3.cc. The correct references need to be added.  2- The EAP message is an optional IE in the RELAY KEY REJECT message, but it is added with the format "LV-E". It shall be of the format "TLV-E".  3- , The "Relay key response parameters" is a mandatory IE in the RELAY KEY ACCEPT message, but it is added with the format "TLV-E". It shall be of the format "LV-E".  4- The Relay key request parameters is a type 6 IE hence it shall be of format "LV**-E**" in the RELAY KEY REQUEST message.  5- The lengths of Relay key request parameters IE and Relay key response parameters IE are marked as TBD. It is proposed to set the lengths as the length limit (2 to 65537).  6- One correction is needed in clause 5.5.4.4, where there is an extra word "key" that is not needed. | | | | | | | | |
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| ***Summary of change:*** | | Implementing the corrections mentioned above. | | | | | | | | |
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| ***Consequences if not approved:*** | | Incorrect references and incorrect IE formats stay in the spec. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.5.4.4, 8.2.34.1, 8.2.35.1, 8.2.36.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 \*\*\*\*\*

#### 5.5.4.4 UE-initiated authentication and key agreement procedure accepted by the network

Upon receiving the RELAY KEY REQUEST message, the AMF processes the message and interacts with the AUSF as specified in 3GPP TS 33.503 [56]. If EAP-AKA' authentication for the 5G ProSe UE-to-network relay is initiated by the network, the AMF shall:

a) create a RELAY AUTHENTICATION REQUEST message;

b) set the PRTI IE of the RELAY AUTHENTICATION REQUEST message to the PRTI value of the received RELAY AUTHENTICATION REQUEST message;

c) set the EAP message IE of the RELAY AUTHENTICATION REQUEST message to EAP request message received from the AUSF; and

d) send the RELAY AUTHENTICATION REQUEST message to the UE.

Upon receiving the RELAY AUTHENTICATION REQUEST message, the UE stops the timer T35xx and forwards the EAP message to the 5G ProSe remote UE as specified in 3GPP TS 24.554 [19E].

Upon receiving the EAP response message from the 5G ProSe remote UE as specified in 3GPP TS 24.554 [19E], the UE shall:

a) create a RELAY AUTHENTICATION RESPONSE message;

b) set the PRTI IE of the RELAY AUTHENTICATION RESPONSE message to the PRTI value of the received RELAY AUTHENTICATION REQUEST message;

c) set the EAP message IE of the RELAY AUTHENTICATION RESPONSE message to EAP request message received from the 5G ProSe remote UE; and

d) start a timer T35xx upon sending the RELAY AUTHENTICATION RESPONSE message to the AMF.

After receiving the RELAY AUTHENTICATION RESPONSE message, the AMF may send a new RELAY AUTHENTICATION REQUEST message carrying EAP request message according to further handling of EAP-AKA' authentication from the AUSF as specified in 3GPP TS 33.503 [56]. The UE repeats the handling of RELAY AUTHENTICATION REQUEST as described above.

Upon receiving the message from the AUSF that the authentication is successful, the AMF shall:

a) create a RELAY KEY ACCEPT message;

b) set the PRTI IE of the RELAY KEY ACCEPT message to the PRTI value of the last received RELAY AUTHENTICATION RESPONSE message;

c) include the EAP message IE of the RELAY KEY ACCEPT message set to EAP-success message received from the AUSF; and

d) include the relay key response parameters IE of the RELAY KEY ACCEPT message set to KNR\_ProSe and nonce\_2 received from AUSF;

Upon receiving the RELAY KEY ACCEPT message, the UE shall forward the EAP-success message and nonce\_2 to the 5G ProSe remote UE as specified in 3GPP TS 24.554 [19E], and considers the authentication is completed successfully.

\*\*\*\*\* Next change \*\*\*\*\*

#### 8.2.34.1 Message definition

The RELAY KEY REQUEST message is sent by the UE to the AMF for initiation of PC5 keys establishment with the 5G ProSe remote UE as specified in 3GPP TS 33.503 [56]. See table 8.2.34.1.

Message type: RELAY KEY REQUEST

Significance: dual

Direction: UE to network

Table 8.2.34.1: RELAY KEY REQUEST message content

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| IEI | Information Element | Type/Reference | Presence | Format | Length |
|  | Extended protocol discriminator | Extended protocol discriminator  9.2 | M | V | 1 |
|  | Security header type | Security header type  9.3 | M | V | 1/2 |
|  | Spare half octet | Spare half octet  9.5 | M | V | 1/2 |
|  | Relay key request message identity | Message type  9.7 | M | V | 1 |
|  | PRTI | ProSe relay transaction identity  9.11.3.88 | M | V | 1 |
|  | Relay key request parameters | Relay key request parameters  9.11.3.89 | M | LV-E | 2-65537 |

\*\*\*\*\* Next change \*\*\*\*\*

#### 8.2.35.1 Message definition

The RELAY KEY ACCEPT message is sent by the AMF to the UE as specified in 3GPP TS 33.503 [56]. See table 8.2.35.1.

Message type: RELAY KEY ACCEPT

Significance: dual

Direction: network to UE

Table 8.2.35.1: RELAY KEY ACCEPT message content

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| IEI | Information Element | Type/Reference | Presence | Format | Length |
|  | Extended protocol discriminator | Extended protocol discriminator  9.2 | M | V | 1 |
|  | Security header type | Security header type  9.3 | M | V | 1/2 |
|  | Spare half octet | Spare half octet  9.5 | M | V | 1/2 |
|  | Relay key accept message identity | Message type  9.7 | M | V | 1 |
|  | PRTI | ProSe relay transaction identity  9.11.3.88 | M | V | 1 |
|  | EAP message | EAP message  9.11.2.2 | M | LV-E | 6-1502 |
|  | Relay key response parameters | Relay key response parameters  9.11.3.90 | M | LV-E | 2-65537 |

\*\*\*\*\* Next change \*\*\*\*\*

#### 8.2.36.1 Message definition

The RELAY KEY REJECT message is sent by the AMF to the UE to indicate the rejection of the relay key request. See table 8.2.36.1.

Message type: RELAY KEY REJECT

Significance: dual

Direction: network to UE

Table 8.2.36.1: RELAY KEY REJECT message content

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| IEI | Information Element | Type/Reference | Presence | Format | Length |
|  | Extended protocol discriminator | Extended protocol discriminator  9.2 | M | V | 1 |
|  | Security header type | Security header type  9.3 | M | V | 1/2 |
|  | Spare half octet | Spare half octet  9.5 | M | V | 1/2 |
|  | Relay key reject message identity | Message type  9.7 | M | V | 1 |
|  | PRTI | ProSe relay transaction identity  9.11.3.88 | M | V | 1 |
| 78 | EAP message | EAP message  9.11.2.2 | O | TLV-E | 7-1503 |

\*\*\*\*\* End of changes \*\*\*\*\*