**3GPP TSG-CT WG1 Meeting #123-eC1-202907**

**Electronic meeting, 16-24 April 2020**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **24.302** | **CR** | **0718** | **rev** | **1** | **Current version:** | **16.3.0** |  |
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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 NETWORK\_FAILURE notification to capture ePDG overload | | | | | | | | | |
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| ***Source to WG:*** | Nokia, Nokia Shanghai Bell, Charter Communications | | | | | | | | | |
| ***Source to TSG:*** | C1 | | | | | | | | | |
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| ***Work item code:*** | 5GProtoc16-non3GPP | | | | |  | ***Date:*** | | | 2020-03-20 |
|  |  | | | |  | |  | | |  |
| ***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 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-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:*** | | TS 24.302 specifies in Table 8.1.2.2-1 the cases that the ePDG provides a Network failure indication to the UE. However, existing specs do not specify any ePDG handling in the procedures part, e.g. for cases that the ePDG itself or the network is congested. If the ePDG does not provide a response, the UE will keep on retrying, resulting to further network congestion.  We clarify in the ePDG procedures that the ePDG may notify the UE about network failures as congestion, such that the UE does not reinitiate the procedure until certain conditions are met. | | | | | | | | |
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| ***Summary of change:*** | | Add that the ePDG may construct an IKE\_AUTH response message with a NETWORK\_FAILURE indication also due to internal overload | | | | | | | | |
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| ***Consequences if not approved:*** | | Redundant message exchanges causing network performance degradation and increased UE energy consumption | | | | | | | | |
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| ***Clauses affected:*** | | 7.4.1.2 | | | | | | | | |
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|  | | **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:*** | |  | | | | | | | | |

#### 7.4.1.2 Tunnel establishment not accepted by the network

During the tunnel establishment procedures, if the ePDG receives from the AAA Server the Authentication and Authorization Answer message with the Result code IE (as specified in 3GPP TS 29.273 [17]):

a) DIAMETER\_ERROR\_USER\_NO\_NON\_3GPP\_SUBSCRIPTION, the ePDG shall include, in the IKE\_AUTH response message to the UE, a Notify payload with a Private Notify Message Type NON\_3GPP\_ACCESS\_TO\_EPC\_NOT\_ALLOWED as defined in subclause 8.1.2;

b) DIAMETER\_ERROR\_USER\_UNKNOWN, the ePDG shall include, in the IKE\_AUTH response message to the UE, a Notify payload with a Private Notify Message Type USER\_UNKNOWN as defined in subclause 8.1.2;

c) DIAMETER\_AUTHORIZATION\_REJECTED, the ePDG shall include, in the IKE\_AUTH response message to the UE, a Notify payload with a Private Notify Message Type AUTHORIZATION\_REJECTED as defined in subclause 8.1.2;

d) DIAMETER\_ERROR\_RAT\_TYPE\_NOT\_ALLOWED, the ePDG shall include, in the IKE\_AUTH response message to the UE, a Notify payload with a Private Notify Message Type RAT\_TYPE\_NOT\_ALLOWED as defined in subclause 8.1.2;

e) DIAMETER\_UNABLE\_TO\_ COMPLY, the ePDG shall include, in the IKE\_AUTH response message to the UE, a Notify payload with a Private Notify Message Type NETWORK\_FAILURE as defined in subclause 8.1.2 and the ePDG may also include a BACKOFF\_TIMER Notify payload of the IKE\_AUTH response message;

f) DIAMETER\_ERROR\_ROAMING\_NOT\_ALLOWED, the ePDG shall include, in the IKE\_AUTH response message to the UE, a Notify payload with a Private Notify Message Type PLMN\_NOT\_ALLOWED as defined in subclause 8.1.2;

g) DIAMETER\_ERROR\_ USER\_NO\_APN\_SUBSCRIPTION, the ePDG shall include, in the IKE\_AUTH response message to the UE, a Notify Payload with a Private Notify Message Type NO\_APN\_SUBSCRIPTION as defined in subclause 8.1.2 and the ePDG may also include a BACKOFF\_TIMER Notify payload of the IKE\_AUTH response message; or

h) DIAMETER\_ERROR\_ILLEGAL\_EQUIPMENT, the ePDG shall include, in the IKE\_AUTH response message to the UE, a Notify payload with a Private Notify Message Type ILLEGAL\_ME as defined in subclause 8.1.2.

NOTE: In the cases a) through h), the ePDG still provides to the UE the information needed to authenticate the ePDG.

During the tunnel establishment procedures, the ePDG when the network has determined that the requested procedure cannot be completed successfully due to a network failure, e.g. due to network congestion, may include in the IKE\_AUTH response message to the UE:

a) a Notify payload with a Private Notify Message Type NETWORK\_FAILURE as defined in 3GPP TS 24.502 [77]; and

b) a BACKOFF\_TIMER Notify payload of the IKE\_AUTH response message.

If NBM is used and if the ePDG needs to reject a PDN connection due to conditions as specified in 3GPP TS 29.273 [17] or the network policies or the ePDG capabilities to indicate that no more PDN connection request of the given APN can be accepted for the UE, the ePDG shall include, in the IKE\_AUTH response message, a Notify payload with a Private Notify Message Type PDN\_CONNECTION\_REJECTION as specified in subclause 8.1.2. Additionally if the IKE\_AUTH request message from the UE indicated Handover Attach as specified in subclause 7.2.2, and the ePDG needs to reject a PDN connection for example due to the corresponding PDN GW identity not received for the APN, the ePDG shall include, in the IKE\_AUTH response message, a Notify payload with a Private Notify Message Type "PDN\_CONNECTION\_REJECTION" as specified in subclause 8.1.2 and the Notification Data field with the IP address information from the Handover Attach indication. If the UE indicated Initial Attach, the Notification Data field shall be omitted.

If the ePDG needs to reject a PDN connection due to the network policies or capabilities to indicate that no more PDN connection request with any APN can be accepted for the UE, the ePDG shall include in the IKE\_AUTH response message containing the IDr payload a Notify payload with a Private Notify Message Type MAX\_CONNECTION\_REACHED as specified in subclause 8.1.2.