**3GPP TSG-CT WG1 Meeting #130-eC1-213583**

**Electronic meeting, 20-28 May 2021**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  |  | **CR** |  | **rev** | **4** | **Current version:** | **17.2.0** |  |
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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 | **x** | Radio Access Network |  | Core Network |  |

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| ***Title:*** | Clarify behavior for ESM failure during transfer of existing emergency PDN connection/PDU session | | | | | | | | | |
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| ***Source to WG:*** | BlackBerry UK Ltd. | | | | | | | | | |
| ***Source to TSG:*** | C1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5GProtoc17 | | | | |  | ***Date:*** | | | 2021-05-06 |
|  |  | | | |  | |  | | |  |
| ***Category:*** |  |  | | | | | ***Release:*** | | |  |
|  | *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:*** | | A network may reject a request to transfer an emergency session or it may time-out.  The currently specified behavior allows the UE:  - to automatically terminate the emergency session and initiate another emergency call attempt even if the emergency session was active when the transfer request was rejected:  A newly initiated emergency call need not be routed to the same PSAP or to the same PSAP call taker. This will cause delay as the user will have to explain the emergency again.  More importantly, there are no requirements for the UE to re-establish an ongoing emergency call when a failure is indicated by the network.  - to automatically perform emergency NAS registration.  A UE that is emergency NAS registered cannot receive a PSAP callback. There is no need to prevent the user from receiving a PSAP callback. A voice capable UE should attempt to be available for voice calls or retry the transfer. | | | | | | | | |
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| ***Summary of change:*** | | Clarify BEHAVIOR:  - prevent the UE from automatically terminating an active emergency session and automatically initiating another emergency call attempt.  - caution against the UE from being unavailable for PSAP callback if a transfer of an emergency call was rejected. | | | | | | | | |
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| ***Consequences if not approved:*** | | UE permitted to terminate an active emergency session, without user consent.  The UE is unavailable for PSAP call back (following emergency transfer failure) due to being emergency NAS registered. | | | | | | | | |
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| ***Clauses affected:*** | | 6.5.1.4.1, 6.5.1.5 | | | | | | | | |
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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:*** | |  | | | | | | | | |

\*\*\* First change \*\*\*

#### 6.5.1.4 UE requested PDN connectivity procedure not accepted by the network

##### 6.5.1.4.1 General

If connectivity with the requested PDN cannot be accepted by the network, the MME shall send a PDN CONNECTIVITY REJECT message to the UE. The message shall contain the PTI and an ESM cause value indicating the reason for rejecting the UE requested PDN connectivity.

The ESM cause IE typically indicates one of the following ESM cause values:

#8: operator determined barring;

#26: insufficient resources;

#27: missing or unknown APN;

#28: unknown PDN type;

#29: user authentication or authorization failed;

#30: request rejected by Serving GW or PDN GW;

#31: request rejected, unspecified;

#32: service option not supported;

#33: requested service option not subscribed;

#34: service option temporarily out of order;

#35: PTI already in use;

#38: network failure;

#50: PDN type IPv4 only allowed;

#51: PDN type IPv6 only allowed;

#53: ESM information not received;

#54: PDN connection does not exist;

#55: multiple PDN connections for a given APN not allowed;

#57: PDN type IPv4v6 only allowed;

#58: PDN type non IP only allowed;

#61: PDN type Ethernet only allowed;

#65: maximum number of EPS bearers reached;

#66: requested APN not supported in current RAT and PLMN combination;

#95 – 111: protocol errors;

#112: APN restriction value incompatible with active EPS bearer context;

#113: Multiple accesses to a PDN connection not allowed.

The network may include a Back-off timer value IE in the PDN CONNECTIVITY REJECT message. If the ESM cause value is #26 "insufficient resources" and the PDN CONNECTIVITY REQUEST message was received via a NAS signalling connection established with RRC establishment cause "High priority access AC 11 – 15" or the request type in the PDN CONNECTIVITY REQUEST message was set to "emergency" or "handover of emergency bearer services", the network shall not include a Back-off timer value IE.

If the Back-off timer value IE is included and the ESM cause value is different from #26 "insufficient resources", #50 "PDN type IPv4 only allowed", #51 "PDN type IPv6 only allowed", #57 "PDN type IPv4v6 only allowed", #58 "PDN type non IP only allowed", #61 "PDN type Ethernet only allowed", and #65 "maximum number of EPS bearers reached", the network may include the Re-attempt indicator IE to indicate:

- whether the UE is allowed to attempt a PDP context activation procedure in the PLMN for the same APN in A/Gb or Iu mode or a PDU session establishment procedure in the PLMN for the same APN in N1 mode; and

- whether another attempt in A/Gb and Iu mode, in S1 mode or in N1 mode is allowed in an equivalent PLMN.

If the ESM cause value is #50 "PDN type IPv4 only allowed", #51 "PDN type IPv6 only allowed", #57 "PDN type IPv4v6 only allowed", #58 "PDN type non IP only allowed" or #61 "PDN type Ethernet only allowed", the network may include the Re-attempt indicator IE without Back-off timer value IE to indicate whether the UE is allowed to attempt a PDN connectivity procedure in an equivalent PLMN for the same APN in S1 mode using the same PDN type.

If the ESM cause value is #66 "requested APN not supported in current RAT and PLMN combination", the network may include the Re-attempt indicator IE without Back-off timer value IE to indicate whether the UE is allowed to attempt a PDN connectivity procedure in an equivalent PLMN for the same APN in S1 mode.

Upon receipt of the PDN CONNECTIVITY REJECT message, the UE shall stop timer T3482 and enter the state PROCEDURE TRANSACTION INACTIVE.

If the PDN CONNECTIVITY REJECT message is due to an ESM failure notified by EMM layer (i.e., EMM cause #19 "ESM failure" included in an ATTACH REJECT message), the UE may include a different APN in the PDN CONNECTIVITY REQUEST message.

NOTE 1: When receiving EMM cause #19 "ESM failure", coordination is required between the EMM and ESM sublayers in the UE to notify the ESM failure.

If the PDN CONNECTIVITY REQUEST message was sent with request type set to "emergency" or "handover of emergency bearer services" in a stand-alone PDN connectivity procedure and the UE receives a PDN CONNECTIVITY REJECT message, then the UE may:

a) inform the upper layers of the failure to establish the emergency bearer; or

NOTE 2: If the PDN CONNECTIVITY REQUEST message had a request type set to:

- "emergency"; or

- "handover of emergency bearer services", the PDN CONNECTIVITY REQUEST message is transferring an emergency PDN connection or interworking an emergency PDU session, and the upper layer determines that there is no active IMS emergency call associated with the PDN connection or the PDU session;

this can result in the upper layers requesting establishment of a CS emergency call (if not already attempted in the CS domain) or other implementation specific mechanisms, e.g. procedures specified in 3GPP TS 24.229 [13D] can result in the emergency call being attempted to another IP-CAN.

b) detach locally, if not detached already, attempt EPS attach for emergency bearer services.

NOTE 3: If UE detaches or attempts EPS attach for emergency bearer services when the UE is transferring an emergency PDN connection or interworking an emergency PDU session that had an active IMS emergency call associated with it, the UE cannot receive a call-back from a PSAP (see 3GPP TS 22.101 [46]).

If the PDN CONNECTIVITY REQUEST message was sent with PDN type set to "Ethernet" and the UE receives a PDN CONNECTIVITY REJECT message with ESM cause #58 "PDN type non IP only allowed", then the UE may attempt a PDN connectivity procedure with the non-IP PDN type.

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

#### 6.5.1.5 Abnormal cases in the UE

The following abnormal cases can be identified:

a) T3482 expired

On the first expiry of the timer T3482:

- if the PDN CONNECTIVITY REQUEST message was sent with request type set to "emergency" or "handover of emergency bearer services" in a stand-alone PDN connectivity procedure, then the UE shall:

a) inform the upper layers of the failure to establish the emergency bearer; or

NOTE 1: If the PDN CONNECTIVITY REQUEST message had a request type set to:

- "emergency"; or

- "handover of emergency bearer services", the PDN CONNECTIVITY REQUEST message is transferring an emergency PDN connection or interworking an emergency PDU session, and the upper layer determines that there is no active IMS emergency call associated with the PDN connection or the PDU session;

this can result in the upper layers requesting establishment of a CS emergency call (if not already attempted in the CS domain), or other implementation specific mechanisms, e.g. procedures specified in 3GPP TS 24.229 [13D] can result in the emergency call being attempted to another IP-CAN.

b) detach locally, if not detached already, attempt EPS attach for emergency bearer services.

NOTE 2: If UE detaches or attempts EPS attach for emergency bearer services when the UE is transferring an emergency PDN connection or interworking an emergency PDU session that had an active IMS emergency call associated with it, the UE cannot receive a call-back from a PSAP (see 3GPP TS 22.101 [46]).

- otherwise, the UE shall resend the PDN CONNECTIVITY REQUEST and shall reset and restart timer T3482. This retransmission is repeated four times, i.e. on the fifth expiry of timer T3482, the UE shall abort the procedure, release the PTI allocated for this invocation and enter the state PROCEDURE TRANSACTION INACTIVE.

b) T3447 is running

The UE shall not send a PDN CONNECTIVITY REQUEST message when the UE is in EMM-CONNECTED mode after the UE attached without PDN connection, unless:

- establishment of a PDN connection for emergency bearer services is requested;

- the UE is a UE configured to use AC11 – 15 in the selected PLMN; or

- a network initiated signalling message has been received.

The PDN CONNECTIVITY REQUEST message can be sent, if still necessary, when timer T3447 expires.