**3GPP TSG-CT WG1 Meeting #128bis-eC1-210774**

**Electronic meeting, 25 February – 5 March 2021**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
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|  | **24.301** | **CR** | **2994** | **rev** | **-** | **Current version:** | **17.1.0** |  |
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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:***  | Correct behavior for ESM failure during transfer of existing emergency PDN connection  |
|  |  |
| ***Source to WG:*** | BlackBerry UK Ltd. |
| ***Source to TSG:*** | C1 |
|  |  |
| ***Work item code:*** | 5GProtoc17 |  | ***Date:*** | 2021-02-04 |
|  |  |  |  |  |
| ***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 canbe 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)Rel-17 (Release 17)* |
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| ***Reason for change:*** | A network may reject a request to transfer an emergency session. 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. - Finally, the ESM layer does not know if emergency bearers have been deactivated normallly. The user may have terminated the emergency call normally, prior to transfer. - to automatically perform emergency registration. A UE that is emergency 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:*** | Correct NOTE: - prevent a UE from automatically terminating an active emergency session and automatically initiating another emergency call attempt.Correct BEHAVIOR: - prevent a UE from being unavailable for PSAP callback if a transfer of an emergency call was rejected.- forbid a UE from locally releasing the emergency PDU session if user-plane resources associated with that emergency PDU session are established, when it fails to transfer.NIT: fixed references for TS 23.501. From [8] to [58]. |
|  |  |
| ***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 registered. |
|  |  |
| ***Clauses affected:*** | 5.3.19.2, 6.3.9, 6.4.1.3, 6.4.2.3, 6.4.3.3, 6.5.1.4.1, 6.5.1.5 |
|  |  |
|  | **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:*** | Made note 2 positive (Ivo)Need to request new CR#num (Frederic)Bullet b) reworded (Osama)Added same changes to 6.5.1.5 (inspired by Sung)Addressed concerns by Roland |

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

#### 5.3.19.2 Redirection of the UE by the core network

The network that supports CIoT optimizations can redirect a UE between EPC and 5GCN as specified in subclause 5.31.3 of 3GPP TS 23.501 [58]. The network can take into account the UE’s N1 mode capability or S1 mode capability, the CIoT network behaviour supported and preferred by the UE or the CIoT network behaviour supported by the network to determine the redirection.

NOTE: It is assumed that the network would avoid redirecting the UE back and forth between EPC and 5GCN.

The network redirects the UE to 5GCN by rejecting the attach request, or tracking area update request, or service request with the EMM cause #31 "Redirection to 5GCN required" as specified in subclause 5.5.1.2.5, 5.5.1.3.5, 5.5.3.2.5, 5.5.3.3.5 and 5.6.1.5. Upon receipt of reject message, the UE disables the E-UTRA capability as specified in subclause 4.5 and enables the N1 mode capability if it was disabled in order to move to 5GCN.

The network that supports CIoT optimizations can also redirect a UE from 5GCN to EPC as specified in subclause 4.8.4A.2 of 3GPP TS 24.501 [54].

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

### 6.3.9 Handling of APN rate control

APN rate control controls the maximum number of uplink user data messages including uplink exception data reporting sent by the UE in a time interval for the APN in accordance with 3GPP TS 23.401 [10]. The UE shall limit the rate at which it generates uplink user data messages to comply with the APN rate control policy. The NAS shall provide the indicated rates to upper layers for enforcement. The indicated rates in a NAS procedure applies to the APN the NAS procedure corresponds to, and the indicated rates are valid until a new value is indicated or the last PDN connection using this APN is released.

If the UE supports APN rate control, the UE shall provide the support indication of APN rate control and additional APN rate control for exception data reporting to the network. If the UE indicates support of additional APN rate control for exception data reporting, the network may provide the APN rate control parameters for exception data to the UE. If the UE does not indicate support of additional APN rate control for exception data reporting, the network shall not provide the APN rate control parameters for exception data to the UE.

If an allowed indication of additional exception reports is provided with the APN rate control parameters and:

- the additional APN rate control parameters for exception data is provided and the limit for additional rate for exception data reporting is not reached; or

- the additional APN rate control parameters for exception data is not provided,

the UE is allowed to send uplink exception reports even if the limit for the APN rate control has been reached.

NOTE 1: The HPLMN can discard or delay user data that exceeds the limit provided for APN rate control.

Upon inter-system change from S1 mode to N1 mode, the UE shall store the current APN rate control status for each APN associated with PDN connection(s) to be transferred from S1 mode to N1 mode as specified in 3GPP TS 23.501 [58].

NOTE 2: How long the UE stores the current APN rate control status is implementation specific.

Upon inter-system change from N1 mode to S1 mode, the UE shall use the stored APN rate control status, if any, to comply with the APN rate control policy for an APN as specified in 3GPP TS 23.501 [58] if:

a) there is at least one PDN connection associated with this APN was transferred from N1 mode to S1 mode; and

b) the validity period of the stored APN rate control status has not expired.

After inter-system change from S1 mode to N1 mode, if all the PDU sessions associated with the same APN that was used in S1 mode are released, the UE shall delete the stored APN rate control status for this APN.

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

#### 6.4.1.3 Default EPS bearer context activation accepted by the UE

Upon receipt of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message, if the UE provided an APN for the establishment of the PDN connection, the UE shall stop timer T3396 if it is running for the APN provided by the UE. If the UE did not provide an APN for the establishment of the PDN connection and the request type was different from "emergency" and from "handover of emergency bearer services", the UE shall stop the timer T3396 associated with no APN if it is running. If the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message was received in response to a request for an emergency PDN connection, the UE shall not stop the timer T3396 associated with no APN if it is running. For any case, the UE shall then send an ACTIVATE DEFAULT EPS BEARER CONTEXT ACCEPT message and enter the state BEARER CONTEXT ACTIVE. When the default bearer is activated as part of the attach procedure, the UE shall send the ACTIVATE DEFAULT EPS BEARER CONTEXT ACCEPT message together with ATTACH COMPLETE message. When the default bearer is activated as the response to the stand-alone PDN CONNECTIVITY REQUEST message, the UE shall send the ACTIVATE DEFAULT EPS BEARER CONTEXT ACCEPT message alone.

If a WLAN offload indication information element is included in the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message, the UE shall store the WLAN offload acceptability values for this PDN connection and use the E-UTRAN offload acceptability value to determine whether this PDN connection is offloadable to WLAN or not.

The UE checks the PTI in the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message to identify the UE requested PDN connectivity procedure to which the default bearer context activation is related (see subclause 6.5.1).

If the UE receives a serving PLMN rate control IE in the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message, the UE shall store the serving PLMN rate control IE value and use the stored serving PLMN rate control value as the maximum allowed limit of uplink User data container IEs included in ESM DATA TRANSPORT messages for the corresponding PDN connection in accordance with 3GPP TS 23.401 [10].

If the UE receives an APN rate control parameters container in the protocol configuration options IE or extended protocol configuration options IE in the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message, the UE shall store the APN rate control parameters value and use the stored APN rate control parameters value as the maximum allowed limit of uplink user data related to the APN indicated in the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message in accordance with 3GPP TS 23.401 [10]. If the UE has a previously stored APN rate control parameters value for this APN, the UE shall replace the stored APN rate control parameters value for this APN with the received APN rate control parameters value.

If the UE receives an additional APN rate control parameters for exception data container in the protocol configuration options IE or extended protocol configuration options IE in the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message, the UE shall store the additional APN rate control parameters for exception data value and use the stored additional APN rate control parameters for exception data value as the maximum allowed limit of uplink exception data related to the APN indicated in the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message in accordance with 3GPP TS 23.401 [10]. If the UE has a previously stored additional APN rate control parameters for exception data value for this APN, the UE shall replace the stored additional APN rate control parameters for exception data value for this APN with the received additional APN rate control parameters for exception data value.

If the UE receives a small data rate control parameters container in the protocol configuration options IE or the extended protocol configuration options IE in the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message, the UE shall store the small data rate control parameters value and use the stored small data rate control parameters value as the maximum allowed limit of uplink user data for the corresponding PDU session that becomes transferred after inter-system change from S1 mode to N1 mode in accordance with 3GPP TS 23.501 [58].

If the UE receives an additional small data rate control parameters for exception data container in the protocol configuration options IE or the extended protocol configuration options IE in the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message, the UE shall store the additional small data rate control parameters for exception data value and use the stored additional small data rate control parameters for exception data value as the maximum allowed limit of uplink exception data for the corresponding PDU session that becomes transferred after inter-system change from S1 mode to N1 mode in accordance with 3GPP TS 23.501 [58].

If the UE receives non-IP Link MTU parameter, Ethernet Frame Payload MTU parameter, or IPv4 Link MTU parameter of the protocol configuration options IE or of the extended protocol configuration options IE in the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message, the UE shall pass the received Non-IP Link MTU, Ethernet Frame Payload MTU size, or IPv4 Link MTU to the upper layer.

NOTE 1: The Non-IP Link MTU and the IPv4 Link MTU size correspond to the maximum length of user data that can be sent either in the user data container in the ESM DATA TRANSPORT message or via S1-U interface.

NOTE 2: The Ethernet frame payload MTU size corresponds to the maximum length of a payload of an Ethernet frame that can be sent either in the user data container in the ESM DATA TRANSPORT message or via S1-U interface.

Upon receiving the DNS server security information, the UE shall pass it to the upper layer. The UE shall use this information to send the DNS over (D)TLS (See 3GPP TS 33.501 [24]).

NOTE 3: Support of DNS over (D)TLS is based on the informative requirements as specified in 3GPP TS 33.501 [24].

Upon receipt of the ACTIVATE DEFAULT EPS BEARER CONTEXT ACCEPT message, the MME shall enter the state BEARER CONTEXT ACTIVE and stop the timer T3485, if the timer is running. If the PDN CONNECTIVITY REQUEST message included a low priority indicator set to "MS is configured for NAS signalling low priority", the MME shall store the NAS signalling low priority indication within the default EPS bearer context.

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

#### 6.4.2.3 Dedicated EPS bearer context activation accepted by the UE

Upon receipt of the ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST message, if the UE provided an APN for the establishment of the PDN connection, the UE shall stop timer T3396, if it is running for the APN provided by the UE. If the UE did not provide an APN for the establishment of the PDN connection and the request type was different from "emergency" and from "handover of emergency bearer services", the UE shall stop the timer T3396 associated with no APN if it is running. If the ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST message was received for an emergency PDN connection, the UE shall not stop the timer T3396 associated with no APN if it is running. For any case, the UE shall then check the received TFT before taking it into use, send an ACTIVATE DEDICATED EPS BEARER CONTEXT ACCEPT message and enter the state BEARER CONTEXT ACTIVE. The ACTIVATE DEDICATED EPS BEARER CONTEXT ACCEPT message shall include the EPS bearer identity.

The linked EPS bearer identity included in the ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST message indicates to the UE to which default bearer, IP address and PDN the dedicated bearer is linked.

If the ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST message contains a PTI value other than "no procedure transaction identity assigned" and "reserved" (see 3GPP TS 24.007 [12]), the UE uses the PTI to identify the UE requested bearer resource allocation procedure or the UE requested bearer resource modification procedure to which the dedicated bearer context activation is related.

If the ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST message contains a PTI value other than "no procedure transaction identity assigned" and "reserved" (see 3GPP TS 24.007 [12]) and the PTI is associated to a UE requested bearer resource allocation procedure or a UE requested bearer resource modification procedure, the UE shall release the traffic flow aggregate description associated to the PTI value provided.

The UE shall use the received TFT to apply mapping of uplink traffic flows to the radio bearer.

The UE shall treat any packet filter without explicit direction as being bi-directional.

If the UE receives an APN rate control parameters container in the protocol configuration options IE or extended protocol configuration options IE in the ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST message, the UE shall store the APN rate control parameters value and use the stored APN rate control parameters value as the maximum allowed limit of uplink user data related to the corresponding APN in accordance with 3GPP TS 23.401 [10]. If the UE has a previously stored APN rate control parameters value for this APN, the UE shall replace the stored APN rate control parameters value for this APN with the received APN rate control parameters value.

If the UE receives an additional APN rate control parameters for exception data container in the protocol configuration options IE or extended protocol configuration options IE in the ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST message, the UE shall store the additional APN rate control parameters for exception data value and use the stored additional APN rate control parameters for exception data value as the maximum allowed limit of uplink exception data related to the corresponding APN in accordance with 3GPP TS 23.401 [10]. If the UE has a previously stored additional APN rate control parameters for exception data value for this APN, the UE shall replace the stored additional APN rate control parameters for exception data value for this APN with the received additional APN rate control parameters for exception data value.

If the UE receives a small data rate control parameters container in the protocol configuration options IE or the extended protocol configuration options IE in the ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST message, the UE shall store the small data rate control parameters value and use the stored small data rate control parameters value as the maximum allowed limit of uplink user data for the corresponding PDU session that becomes transferred after inter-system change from S1 mode to N1 mode in accordance with 3GPP TS 23.501 [58]. If the UE has a previously stored small data rate control parameters value for this PDU session, the UE shall replace the stored small data rate control parameters value for this PDU Session with the received small data rate control parameters value.

If the UE receives an additional small data rate control parameters for exception data container in the protocol configuration options IE or the extended protocol configuration options IE in the ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST message, the UE shall store the additional small data rate control parameters for exception data value and use the stored additional small data rate control parameters for exception data value as the maximum allowed limit of uplink exception data for the corresponding PDU session that becomes transferred after inter-system change from S1 mode to N1 mode in accordance with 3GPP TS 23.501 [58]. If the UE has a previously stored additional small data rate control parameters for exception data value for this PDU session, the UE shall replace the stored additional small data rate control parameters for exception data value for this PDU session with the received additional small data rate control parameters for exception data value.

If the UE receives QoS rule(s) of the 5GS QoS flow(s), which corresponds to the dedicated EPS bearer being activated, in the protocol configuration options IE or the extended protocol configuration options IE of the ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST message, the UE stores the QoS rule(s) for use during inter-system change from S1 mode to N1 mode.

Upon receipt of the ACTIVATE DEDICATED EPS BEARER CONTEXT ACCEPT message, the MME shall stop the timerT3485 and enter the state BEARER CONTEXT ACTIVE.

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

#### 6.4.3.3 EPS bearer context modification accepted by the UE

Upon receipt of the MODIFY EPS BEARER CONTEXT REQUEST message, if the UE provided an APN for the establishment of the PDN connection, the UE shall stop timer T3396, if it is running for the APN provided by the UE. If the UE did not provide an APN for the establishment of the PDN connection and the request type was different from "emergency" and from "handover of emergency bearer services", the UE shall stop the timer T3396 associated with no APN if it is running. If the MODIFY EPS BEARER CONTEXT REQUEST message was received for an emergency PDN connection, the UE shall not stop the timer T3396 associated with no APN if it is running. For any case, the UE shall then check the received TFT before taking it into use and send a MODIFY EPS BEARER CONTEXT ACCEPT message to the MME.

If the MODIFY EPS BEARER CONTEXT REQUEST message contains a PTI value other than "no procedure transaction identity assigned" and "reserved" (see 3GPP TS 24.007 [12]), the UE uses the PTI to identify the UE requested bearer resource allocation procedure or the UE requested bearer resource modification procedure to which the EPS bearer context modification is related (see subclause 6.5.3 and subclause 6.5.4).

If the MODIFY EPS BEARER CONTEXT REQUEST message contains a PTI value other than "no procedure transaction identity assigned" and "reserved" (see 3GPP TS 24.007 [12]) and the PTI is associated to a UE requested bearer resource allocation procedure or a UE requested bearer resource modification procedure, the UE shall release the traffic flow aggregate description associated to the PTI value provided.

If the EPS bearer context that is modified is a GBR bearer and the MODIFY EPS BEARER CONTEXT REQUEST message does not contain the Guaranteed Bit Rate (GBR) and the Maximum Bit Rate (MBR) values for uplink and downlink, the UE shall continue to use the previously received values for the Guaranteed Bit Rate (GBR) and the Maximum Bit Rate (MBR) for the corresponding bearer.

The UE shall use the received TFT to apply mapping of uplink traffic flows to the radio bearer if the TFT contains packet filters for the uplink direction.

If a WLAN offload indication information element is included in the MODIFY EPS BEARER CONTEXT REQUEST message, the UE shall store the WLAN offload acceptability values for this PDN connection and use the E-UTRAN offload acceptability value to determine whether this PDN connection is offloadable to WLAN or not.

If the UE receives an APN rate control parameters container in the protocol configuration options IE or extended protocol configuration options IE in the MODIFY EPS BEARER CONTEXT REQUEST message, the UE shall store the APN rate control parameters value and use the stored APN rate control parameters value as the maximum allowed limit of uplink user data related to the corresponding APN in accordance with 3GPP TS 23.401 [10]. If the UE has a previously stored APN rate control parameters value for this APN, the UE shall replace the stored APN rate control parameters value for this APN with the received APN rate control parameters value.

If the UE receives an additional APN rate control parameters for exception data container in the protocol configuration options IE or extended protocol configuration options IE in the MODIFY EPS BEARER CONTEXT REQUEST message, the UE shall store the additional APN rate control parameters for exception data value and use the stored additional APN rate control parameters for exception data value as the maximum allowed limit of uplink exception data related to the corresponding APN in accordance with 3GPP TS 23.401 [10]. If the UE has a previously stored additional APN rate control parameters for exception data value for this APN, the UE shall replace the stored additional APN rate control parameters for exception data value for this APN with the received additional APN rate control parameters for exception data value.

If the UE receives a small data rate control parameters container in the protocol configuration options IE or the extended protocol configuration options IE in the MODIFY EPS BEARER CONTEXT REQUEST message, the UE shall store the small data rate control parameters value and use the stored small data rate control parameters value as the maximum allowed limit of uplink user data for the corresponding PDU session that becomes transferred after inter-system change from S1 mode to N1 mode in accordance with 3GPP TS 23.501 [58]. If the UE has a previously stored small data rate control parameters value for this PDU session, the UE shall replace the stored small data rate control parameters value for this PDU Session with the received small data rate control parameters value.

If the UE receives an additional small data rate control parameters for exception data container in the protocol configuration options IE or the extended protocol configuration options IE in the MODIFY EPS BEARER CONTEXT REQUEST message, the UE shall store the additional small data rate control parameters for exception data value and use the stored additional small data rate control parameters for exception data value as the maximum allowed limit of uplink exception data for the corresponding PDU session that becomes transferred after inter-system change from S1 mode to N1 mode in accordance with 3GPP TS 23.501 [58]. If the UE has a previously stored additional small data rate control parameters for exception data value for this PDU session, the UE shall replace the stored additional small data rate control parameters for exception data value for this PDU session with the received additional small data rate control parameters for exception data value.

Upon receipt of the MODIFY EPS BEARER CONTEXT REQUEST message with a session-AMBR and QoS rule(s) in the protocol configuration options IE or the extended protocol configuration options IE, the UE stores the session-AMBR and QoS rule(s) for use during inter-system change from S1 mode to N1 mode.

Upon receipt of the MODIFY EPS BEARER CONTEXT ACCEPT message, the MME shall stop the timer T3486 and enter the state BEARER CONTEXT ACTIVE.

\*\*\* Next 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 was sent with request type set to "emergency", 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) if not detached already, detach locally. And if the PDN CONNECTIVITY REQUEST message was sent with request type set to "emergency", attempt EPS attach for emergency bearer services.

If the UE received a PDN CONNECTIVITY REJECT message due to an attempt to activate a default EPS bearer context for an active emergency PDU session using a stand-alone PDN CONNECTIVITY REQUEST message with request type set to "handover of emergency bearer services", the UE shall not locally release the active emergency PDU session. The UE may attempt to transfer the PDU session to another PLMN (see 3GPP TS 24.501 [54]).

NOTE 3: If the transfer attempt is due to an inter-system change from N1 mode to S1 mode, the other PLMN is a PLMN for which the "interworking without N26 interface supported" indication is valid (see 3GPP TS 23.501 [58]).

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 was sent with request type set to "emergency", 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) if not detached already, detach locally. And if the PDN CONNECTIVITY REQUEST message was sent with request type set to "emergency", attempt EPS attach for emergency bearer services.

- if the stand-alone PDN CONNECTIVITY REQUEST message was sent with request type set to "handover of emergency bearer services" due to an attempt to activate a default EPS bearer context for an active emergency PDU session, the UE shall not locally release the active emergency PDU session. The UE may attempt to transfer the PDU session to another PLMN (see 3GPP TS 24.501 [54]).

NOTE 2: If the transfer attempt is due to an inter-system change from N1 mode to S1 mode, the other PLMN is a PLMN for which the "interworking without N26 interface supported" indication is valid (see 3GPP TS 23.501 [58]).

- if the stand-alone PDN CONNECTIVITY REQUEST message was sent with request type set to "handover of emergency bearer services" due to an attempt to transfer an ongoing emergency session from non-3GPP access to 3GPP access, the UE shall not locally release the ongoing emergency session. The UE may attempt to transfer the ongoing emergency session to another PLMN.

- 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.