**3GPP TSG-CT WG1 Meeting #123-eC1-202538**

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

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  | **24.501** | **CR** | **2205** | **rev** | **-** | **Current version:** | **16.4.0** |  |
|  |
| *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 | **X** | Radio Access Network |  | Core Network | **X** |

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|  |
| ***Title:***  | Addition of 5GSM cause #59 |
|  |  |
| ***Source to WG:*** | MediaTek Inc. |
| ***Source to TSG:*** | C1 |
|  |  |
| ***Work item code:*** | 5GProtoc16 |  | ***Date:*** | 2020-04-07 |
|  |  |  |  |  |
| ***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 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)* |
|  |  |
| ***Reason for change:*** | ESM cause #59 “unsupported QCI value” was introduced in EPS which is used in the field. Upon receipt of ESM cause #59, the UE behaviour is unspecified and up to the UE implementation (e.g., indicating ERROR: 181 (unsupported QCI value) by using AT command to the upper layer, and the upper layer solves the issue).Since 5QI (the same concept as QCI) is used in 5GS, and the UE can request a QoS flow with a specific 5QI, we believe the similar error case still happens in 5GS and hence 5GSM cause #59 is required in 5GS as well. |
|  |  |
| ***Summary of change:*** | 5GSM cause #59 “Unsupported 5QI value” is introduced.The network can use 5GSM cause #59 “Unsupported 5QI value” in the UE-requested PDU session modification procedure. |
|  |  |
| ***Consequences if not approved:*** | If the UE requests an unsupported 5QI value, the corresponding 5GSM cause is not defined. |
|  |  |
| ***Clauses affected:*** | 6.4.2.4.1, 9.11.4.2, B.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:*** |  |

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

##### 6.4.2.4.1 General

Upon receipt of a PDU SESSION MODIFICATION REQUEST message, if the SMF does not accepts the request to modify the PDU session, the SMF shall create a PDU SESSION MODIFICATION REJECT message.

The SMF shall set the 5GSM cause IE of the PDU SESSION MODIFICATION REJECT message to indicate the reason for rejecting the PDU session modification.

The 5GSM cause IE typically indicates one of the following SM cause values:

#26 insufficient resources;

#29 user authentication or authorization failed;

#31 request rejected, unspecified;

#32 service option not supported;

#33 requested service option not subscribed;

#35 PTI already in use;

#43 Invalid PDU session identity;

#46 out of LADN service area;

#59 unsupported 5QI value;

#67 insufficient resources for specific slice and DNN;

#69 insufficient resources for specific slice; or

#95 – 111 protocol errors.

If the UE requests a PDU session modification for an LADN when the UE is located outside of the LADN service area, the SMF shall include the 5GSM cause value #46 "out of LADN service area" in the 5GSM cause IE of the PDU SESSION MODIFICATION REJECT message.

If the Extended protocol configuration options IE of the PDU SESSION MODIFICATION REQUEST message indicates 3GPP PS data off UE status and the SMF detects the change of the 3GPP PS data off UE status, the SMF shall not include the 5GSM cause value #26 "insufficient resources", the 5GSM cause value #67 "insufficient resources for specific slice and DNN", the 5GSM cause value #69 "insufficient resources for specific slice" and the 5GSM cause value #46 "out of LADN service area" in the 5GSM cause IE of the PDU SESSION MODIFICATION REJECT message.

The network may include a Back-off timer value IE in the PDU SESSION MODIFICATION REJECT message.

If the 5GSM cause value is #26"insufficient resources", #67 "insufficient resources for specific slice and DNN", or #69 "insufficient resources for specific slice" and the PDU SESSION MODIFICATION REQUEST message was received from a UE configured for high priority access in selected PLMN or the request type provided during the PDU session establishment is set to "initial emergency request" or "existing emergency PDU session", the network shall not include a Back-off timer value IE.

The SMF shall send the PDU SESSION MODIFICATION REJECT message.

Upon receipt of a PDU SESSION MODIFICATION REJECT message and a PDU session ID, using the NAS transport procedure as specified in subclause 5.4.5, the UE shall stop timer T3581, release the allocated PTI value, and enter the state PROCEDURE TRANSACTION INACTIVE.

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

#### 9.11.4.2 5GSM cause

The purpose of the 5GSM cause information element is to indicate the reason why a 5GSM request is rejected.

The 5GSM cause information element is coded as shown in figure 9.11.4.2.1 and table 9.11.4.2.1.

The 5GSM cause is a type 3 information element with 2 octets length.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| 5GSM cause IEI | octet 1 |
| Cause value | octet 2 |

Figure 9.11.4.2.1: 5GSM cause information element

Table 9.11.4.2.1: 5GSM cause information element

|  |
| --- |
| Cause value (octet 2) |
| Bits |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |  |
| 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |  | Operator determined barring |
| 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 |  | Insufficient resources |
| 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 |  | Missing or unknown DNN |
| 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 |  | Unknown PDU session type |
| 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 |  | User authentication or authorization failed |
| 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |  | Request rejected, unspecified |
| 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |  | Service option not supported |
| 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |  | Requested service option not subscribed |
| 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |  | Service option temporarily out of order |
| 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 |  | PTI already in use |
| 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |  | Regular deactivation |
| 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 |  | Network failure |
| 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 |  | Reactivation requested |
| 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 |  | Semantic error in the TFT operation |
| 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |  | Syntactical error in the TFT operation |
| 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 |  | Invalid PDU session identity |
| 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |  | Semantic errors in packet filter(s) |
| 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 |  | Syntactical error in packet filter(s) |
| 0 | 0 | 1 | 0 | 1 | 1 | 1 | 0 |  | Out of LADN service area |
| 0 | 0 | 1 | 0 | 1 | 1 | 1 | 1 |  | PTI mismatch |
| 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 |  | PDU session type IPv4 only allowed |
| 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 |  | PDU session type IPv6 only allowed |
| 0 | 0 | 1 | 1 | 0 | 1 | 1 | 0 |  | PDU session does not exist |
| 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 |  | PDU session type IPv4v6 only allowed |
| 0 | 0 | 1 | 1 | 1 | 0 | 1 | 0 |  | PDU session type Unstructured only allowed |
| 0 | 0 | 1 | 1 | 1 | 0 | 1 | 1 |  | Unsupported 5QI value |
| 0 | 0 | 1 | 1 | 1 | 1 | 0 | 1 |  | PDU session type Ethernet only allowed |
| 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 |  | Insufficient resources for specific slice and DNN |
| 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |  | Not supported SSC mode |
| 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |  | Insufficient resources for specific slice |
| 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 |  | Missing or unknown DNN in a slice |
| 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 |  | Invalid PTI value |
| 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 |  | Maximum data rate per UE for user-plane integrity protection is too low |
| 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 |  | Semantic error in the QoS operation |
| 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 |  | Syntactical error in the QoS operation |
| 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |  | Invalid mapped EPS bearer identity |
| 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 |  | Semantically incorrect message |
| 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |  | Invalid mandatory information |
| 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 |  | Message type non-existent or not implemented |
| 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |  | Message type not compatible with the protocol state |
| 0 | 1 | 1 | 0 | 0 | 0 | 1 | 1 |  | Information element non-existent or not implemented |
| 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |  | Conditional IE error |
| 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |  | Message not compatible with the protocol state |
| 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 |  | Protocol error, unspecified |
|  |  |  |  |  |  |  |  |  |  |
| Any other value received by the UE shall be treated as 0010 0010, "service option temporarily out of order". Any other value received by the network shall be treated as 0110 1111, "protocol error, unspecified". |

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

## B.1 Causes related to nature of request

Cause #8 – Operator Determined Barring

 This 5GSM cause is used by the network to indicate that the requested service was rejected by the SMF due to Operator Determined Barring.

Cause #26 – Insufficient resources

 This 5GSM cause is used by the UE or by the network to indicate that the requested service cannot be provided due to insufficient resources.

Cause #27 – Missing or unknown DNN

 This 5GSM cause is used by the network to indicate that the requested service was rejected by the external DN because the DNN was not included although required or if the DNN could not be resolved.

Cause #28 – Unknown PDU session type

 This 5GSM cause is used by the network to indicate that the requested service was rejected by the external DN because the requested PDU session type could not be recognised or is not allowed.

Cause #29 – User authentication or authorization failed

 This 5GSM cause is used by the network to indicate that the requested service was rejected by the external DN due to a failed user authentication, revoked by the external DN, or rejected by 5GCN due to a failed user authentication or authorization.

Cause #31 – Request rejected, unspecified

 This 5GSM cause is used by the network or by the UE to indicate that the requested service or operation or the request for a resource was rejected due to unspecified reasons.

Cause #32 – Service option not supported

 This 5GSM cause is used by the network when the UE requests a service which is not supported by the PLMN.

Cause #33 – Requested service option not subscribed

 This 5GSM cause is sent when the UE requests a service option for which it has no subscription.

Cause #35 – PTI already in use

 This 5GSM cause is used by the network to indicate that the PTI included by the UE is already in use by another active UE requested procedure for this UE.

Cause #36 – Regular deactivation

 This 5GSM cause is used to indicate a regular UE or network initiated release of PDU session resources.

Cause #38 – Network failure

 This 5GSM cause is used by the network to indicate that the requested service was rejected due to an error situation in the network.

Cause #39 – Reactivation requested

 This 5GSM cause is used by the network to request a PDU session reactivation.

Cause #41 – Semantic error in the TFT operation

 This 5GSM cause is used by the UE to indicate a semantic error in the TFT operation included in the request.

Cause #42 – Syntactical error in the TFT operation

 This 5GSM cause is used by the UE to indicate a syntactical error in the TFT operation included in the request.

Cause #43 –Invalid PDU session identity

 This 5GSM cause is used by the network or the UE to indicate that the PDU session identity value provided to it is not a valid value or the PDU session identified by the PDU session identity IE in the request or the command is not active.

Cause #44 – Semantic errors in packet filter(s)

 This 5GSM cause is used by the network or the UE to indicate that the requested service was rejected due to one or more semantic errors in packet filter(s) of the QoS rule included in the request.

Cause #45 – Syntactical error in packet filter(s)

 This 5GSM cause is used by the network or the UE to indicate that the requested service was rejected due to one or more syntactical errors in packet filter(s) of the QoS rule included in the request.

Cause #46 –Out of LADN service area

 This 5GSM cause is used by the network to indicate the UE is out of the LADN service area.

Cause #47 –PTI mismatch

 This 5GSM cause is used by the network or UE to indicate that the PTI provided to it does not match any PTI in use.

Cause #50 – PDU session type IPv4 only allowed

 This 5GSM cause is used by the network to indicate that only PDU session type IPv4 is allowed for the requested IP connectivity.

Cause #51 – PDU session type IPv6 only allowed

 This 5GSM cause is used by the network to indicate that only PDU session type IPv6 is allowed for the requested IP connectivity.

Cause #54 –PDU session does not exist

 This 5GSM cause is used by the network to indicate that the network does not have any information about the PDU session which is requested by the UE to transfer between 3GPP access and non-3GPP access or from the EPS to the 5GS.

Cause #57 – PDU session type IPv4v6 only allowed

 This 5GSM cause is used by the network to indicate that only PDU session types IPv4, IPv6 or IPv4v6 are allowed for the requested IP connectivity.

Cause #58 – PDU session type Unstructured only allowed

 This 5GSM cause is used by the network to indicate that only PDU session type Unstructured is allowed for the requested DN connectivity.

Cause #59 – Unsupported 5QI value

 This 5GSM cause is used by the network if the 5QI indicated in the UE request cannot be supported.

Cause #61 – PDU session type Ethernet only allowed

 This 5GSM cause is used by the network to indicate that only PDU session type Ethernet is allowed for the requested DN connectivity.

Cause #67 – Insufficient resources for specific slice and DNN

 This 5GSM cause is by the network to indicate that the requested service cannot be provided due to insufficient resources for specific slice and DNN.

Cause #68 – Not supported SSC mode

 This 5GSM cause is used by the network to indicate that the requested SSC mode is not supported.

Cause #69 –Insufficient resources for specific slice

 This 5GSM cause is used by the network to indicate that the requested service cannot be provided due to insufficient resources for specific slice.

Cause #70 – Missing or unknown DNN in a slice

 This 5GSM cause is used by the network to indicate that the requested service was rejected by the external DN because the DNN was not included although required or if the DNN could not be resolved, in the slice.

Cause #81 – Invalid PTI value

 This 5GSM cause is used by the network or UE to indicate that the PTI provided to it is invalid for the specific 5GSM message.

Cause #82 – Maximum data rate per UE for user-plane integrity protection is too low

 This 5GSM cause is used by the network to indicate that the requested service cannot be provided because the maximum data rate per UE for user-plane integrity protection is too low.

Cause #83 – Semantic error in the QoS operation

 This 5GSM cause is used by the network or the UE to indicate that the requested service was rejected due to a semantic error in the QoS operation included in the request.

Cause #84 – Syntactical error in the QoS operation

 This 5GSM cause is used by the network or the UE to indicate that the requested service was rejected due to a syntactical error in the QoS operation included in the request.

Cause #85 – Invalid mapped EPS bearer identity

 This 5GSM cause is used by the network or the UE to indicate that the mapped EPS bearer identity value provided to it is not a valid value or the mapped EPS bearer identified by the mapped EPS bearer identity does not exist.