**3GPP TSG-CT WG1 Meeting #133-eC1-21XXXX**

**E-meeting, 11-19 November 2021**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **24.501** | **CR** | **3629** | **rev** | **3** | **Current version:** | **17.4.1** |  |
|  | | | | | | | | |
| *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:*** | 5GSM cause value of PDU session establishment reject for UAS services | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, HiSilicon, Qualcomm Incorporated | | | | | | | | | |
| ***Source to TSG:*** | C1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | ID\_UAS | | | | |  | ***Date:*** | | | 2021-11-04 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***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:*** | | Based on current stage 2 requirements on UAS services specified in TS 23.256, CT1 has agreed that the SMF needs to reject the PDU session establishment in following two cases:   1. SMF determines that UUAA-SM is required but no CAA-level UAV ID is received from the UE; and 2. SMF determines that C2 authorization is required but no C2 aviation payload is received from the UE.   However, CT1 cannot agree which 5GSM cause value needs to be used in above reject handling and hence, following related ENs were added:  "*Editor's note: Which 5GSM cause value needs to be included in the PDU SESSION ESTABLISHMENT REJECT message and how to inform the UE about need to provide the CAA-level UAV ID is FFS.*"  "*Editor's note: Which 5GSM cause value needs to be included in the PDU SESSION ESTABLISHMENT REJECT message, is FFS.*"  Based on the discussion in C1-215756, following proposals were provided:  **Proposal#1: It proposes to use different NAS cause values for** **the concerned PDU session****/PDN connection establishment reject handling between 5GS and EPS.**  **Proposal#2: In 5GS, it proposes to re-use the new 5GMM cause #79 (UAS services not allowed) defined for UAS services as the new 5GSM cause value for the concerned PDU session establishment reject handling.**  **Reason for change for rev#2:**  As shown in the discussion paper C1-216569, based on below SA2 *yellow* text in TS 23.256 sub 5.2.5.2.3, it clearly indicates the cause is an NAS reject cause, not the parameter included in ePCO:  "*For a UAV with aerial subscription, if the SMF determines based on the requested DNN/S-NSSAI that the authorization procedure with the USS is required, but the UAV has not provided the CAA-Level UAV ID, the SMF rejects the PDU session establishment with a cause indicating that USS authorization is required*."  Furthermore, such NAS 5GSM cause value is required to enforece the UE NAS layer:   1. shall not retry the **same** PDU session establishment request for UAS services without providing the CAA-level UAV ID; and 2. upon receipt of the request from the upper layers to establish a PDU session for UAS services, the UE shall initiate a **new** UE-requested PDU session establishment procedure by including the CAA-level UAV ID.   Note that above enforcement is only at the UE NAS layer, not at the UAV application layer as the information included in the Service-level-AA container is mainly used by the UAV application layer, not the NAS layer. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | It proposes to re-use the new 5GMM cause #79 (UAS services not allowed) defined for UAS services as the new 5GSM cause value for the concerned PDU session establishment reject handling for UUAA-SM or C2 authorization, i.e. new 5GSM cause #86 (UAS services not allowed) with the same cause name.  It proposes to enforce the UE NAS handling for the new 5GSM cause #86 (UAS services not allowed). | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | ENs were remains and the 5GSM cause value of PDU session establishment reject for UAS services is unspecified. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 6.4.1.4.1, 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:*** | | Rev #1 was postponed in CT1#132-e;  Rev #2 covers following updates:   1. Reason for change is updated; 2. UE handling on new 5GSM cause #86 is updated. | | | | | | | | |

\* \* \* First Change \* \* \* \*

##### 6.4.1.4.1 General

If the connectivity with the requested DN is rejected by the network, the SMF shall create a PDU SESSION ESTABLISHMENT REJECT message.

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

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

#8 operator determined barring;

#26 insufficient resources;

#27 missing or unknown DNN;

#28 unknown PDU session type;

#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;

#38 network failure;

#39 reactivation requested;

#46 out of LADN service area;

#50 PDU session type IPv4 only allowed;

#51 PDU session type IPv6 only allowed;

#54 PDU session does not exist;

#57: PDU session type IPv4v6 only allowed;

#58: PDU session type Unstructured only allowed;

#61: PDU session type Ethernet only allowed;

#67 insufficient resources for specific slice and DNN;

#68 not supported SSC mode;

#69 insufficient resources for specific slice;

#70 missing or unknown DNN in a slice;

#82 maximum data rate per UE for user-plane integrity protection is too low;

#86 UAS services not allowed; or

#95 – 111 protocol errors.

If the PDU SESSION ESTABLISHMENT REQUEST message includes a PDU session type IE set to "IPv6", and the subscription, the SMF configuration, or both, are limited to IPv4 only for the requested DNN, the SMF shall include the 5GSM cause value #50 "PDU session type IPv4 only allowed" in the 5GSM cause IE of the PDU SESSION ESTABLISHMENT REJECT message.

If the PDU SESSION ESTABLISHMENT REQUEST message includes a PDU session type IE set to "IPv6", and the subscription, the SMF configuration, or both, support none of "IPv4" and "IPv6" PDU session types for the requested DNN, the SMF shall include the 5GSM cause value #28 "unknown PDU session type" in the 5GSM cause IE of the PDU SESSION ESTABLISHMENT REJECT message.

If the PDU SESSION ESTABLISHMENT REQUEST message includes a PDU session type IE set to "IPv4", and the subscription, the SMF configuration, or both, are limited to IPv6 only for the requested DNN, the SMF shall include the 5GSM cause value #51 "PDU session type IPv6 only allowed" in the 5GSM cause IE of the PDU SESSION ESTABLISHMENT REJECT message.

If the PDU SESSION ESTABLISHMENT REQUEST message includes a PDU session type IE set to "IPv4", and the subscription, the SMF configuration, or both, support none of "IPv4" and "IPv6" PDU session types for the requested DNN, the SMF shall include the 5GSM cause value #28 "unknown PDU session type" in the 5GSM cause IE of the PDU SESSION ESTABLISHMENT REJECT message.

If the PDU SESSION ESTABLISHMENT REQUEST message includes a PDU session type IE set to "IPv4v6", and the subscription, the SMF configuration, or both, support none of "IPv4v6", "IPv4" and "IPv6" PDU session types for the requested DNN, the SMF shall include the 5GSM cause value #28 "unknown PDU session type" in the 5GSM cause IE of the PDU SESSION ESTABLISHMENT REJECT message.

If the PDU SESSION ESTABLISHMENT REQUEST message includes a PDU session type IE set to "Unstructured" or "Ethernet", and the subscription, the SMF configuration, or both, do not support the PDU session type for the requested DNN, the SMF shall include the 5GSM cause value #28 "unknown PDU session type" in the 5GSM cause IE of the PDU SESSION ESTABLISHMENT REJECT message.

If the PDU SESSION ESTABLISHMENT REQUEST message is to establish an MA PDU session and includes a PDU session type IE set to "Unstructured", and the SMF configuration does not support the PDU session type, the SMF shall include the 5GSM cause value #28 "unknown PDU session type" in the 5GSM cause IE of the PDU SESSION ESTABLISHMENT REJECT message.

If the PDU SESSION ESTABLISHMENT REQUEST message contains the SSC mode IE indicating an SSC mode not supported by the subscription, the SMF configuration, or both of them, and the SMF decides to rejects the PDU session establishment, the SMF shall include the 5GSM cause value #68 "not supported SSC mode" in the 5GSM cause IE and the SSC modes allowed by SMF in the Allowed SSC mode IE of the PDU SESSION ESTABLISHMENT REJECT message.

If the PDU SESSION ESTABLISHMENT REQUEST message is to establish an MA PDU session and MA PDU session is not allowed due to operator policy and subscription, and the SMF decides to reject the PDU session establishment, the SMF shall include the 5GSM cause value #33 "requested service option not subscribed" in the 5GSM cause IE of the PDU SESSION ESTABLISHMENT REJECT message.

If the PDU SESSION ESTABLISHMENT REQUEST message is identified to be for C2 communication and does not include the C2 aviation payload, the SMF shall reject the PDU SESSION ESTABLISHMENT REQUEST message by transmitting a PDU SESSION ESTABLISHMENT REJECT message with 5GSM cause IE set to 5GSM cause value #86 "UAS services not allowed".

In 3GPP access, if the operator's configuration requires user-plane integrity protection for the PDU session and, the maximum data rate per UE for user-plane integrity protection supported by the UE for uplink or the maximum data rate per UE for user-plane integrity protection supported by the UE for downlink, or both, are lower than required by the operator's configuration, the SMF shall include the 5GSM cause value #82 "maximum data rate per UE for user-plane integrity protection is too low" in the 5GSM cause IE of the PDU SESSION ESTABLISHMENT REJECT message.

If the UE requests a PDU session establishment 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 ESTABLISHMENT REJECT message.

If the DN authentication of the UE was performed with the PDU session authentication and authorization procedure and completed unsuccessfully, the SMF shall include the 5GSM cause value #29 "user authentication or authorization failed" in the 5GSM cause IE of the PDU SESSION ESTABLISHMENT REJECT message and shall set the EAP message IE of the PDU SESSION ESTABLISHMENT REJECT message to an EAP-failure message as specified in IETF RFC 3748 [34], provided by the DN.

If the DN authentication of the UE was performed with the service-level authentication and authorization procedure and completed unsuccessfully, the SMF shall include the 5GSM cause value #29 "user authentication or authorization failed" in the 5GSM cause IE of the PDU SESSION ESTABLISHMENT REJECT message and shall include the service-level AA response provided by DN in the service-level AA container IE of the PDU SESSION ESTABLISHMENT REJECT message.

Based on the local policy and user's subscription data, if a PDU session is being established with the request type set to "existing PDU session" and the SMF determines the UE has:

a) moved between a tracking area in NB-N1 mode and a tracking area in WB-N1 mode;

b) moved between a tracking area in NB-S1 mode and a tracking area in WB-N1 mode; or

c) moved between a tracking area in WB-S1 mode and a tracking area in NB-N1 mode,

the SMF may reject the PDU SESSION ESTABLISHMENT REQUEST message and:

a) include the 5GSM cause value #39 "reactivation requested" in the 5GSM cause IE of the PDU SESSION ESTABLISHMENT REJECT message; or

b) include a 5GSM cause value other than #39 "reactivation requested" in the 5GSM cause IE of the PDU SESSION ESTABLISHMENT REJECT message.

NOTE 1: The included 5GSM cause value is up to the network implementation.

If the PDU session cannot be established due to resource unavailability in the UPF, the SMF shall include the 5GSM cause value #26 "insufficient resources" in the 5GSM cause IE of the PDU SESSION ESTABLISHMENT REJECT message.

Based on the user's subscription data and the operator policy, if the SMF determines that the UUAA-SM procedure needs to be performed for a UE but the SMF does not receives the Service-level device ID set to the CAA-level UAV ID in the Service-level-AA container IE of the PDU SESSION ESTABLISHMENT REQUEST message from the UE, the SMF shall include the 5GSM cause value #86 "UAS services not allowed" in the 5GSM cause IE of the PDU SESSION ESTABLISHMENT REJECT message.

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

If the 5GSM cause value is #29 "user authentication or authorization failed ", the network should include a Back-off timer value IE.

If the Back-off timer value IE is included and the 5GSM cause value is different from #26 "insufficient resources", #28 "unknown PDU session type", #46 "out of LADN service area", "#50 "PDU session type IPv4 only allowed", #51 "PDU session type IPv6 only allowed", #54 "PDU session does not exist", #57 "PDU session type IPv4v6 only allowed", #58 "PDU session type Unstructured only allowed", #61 "PDU session type Ethernet only allowed", #67 "insufficient resources for specific slice and DNN", #68 "not supported SSC mode", and #69 "insufficient resources for specific slice", the network may include the Re-attempt indicator IE to indicate whether the UE is allowed to attempt a PDN connectivity procedure in the PLMN for the same DNN in S1 mode, and whether another attempt in S1 mode or in N1 mode is allowed in an equivalent PLMN.

If the 5GSM cause value is #50 "PDU session type IPv4 only allowed", #51 "PDU session type IPv6 only allowed", #57 "PDU session type IPv4v6 only allowed", #58 "PDU session type Unstructured only allowed", or #61 "PDU session 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 PDU session establishment procedure in an equivalent PLMN in N1 mode using the same PDU session type for the same DNN (or no DNN, if no DNN was indicated by the UE) and the same S-NSSAI (or no S-NSSAI, if no S-NSSAI was indicated by the UE).

The SMF shall send the PDU SESSION ESTABLISHMENT REJECT message.

Upon receipt of a PDU SESSION ESTABLISHMENT REJECT message and a PDU session ID, using the NAS transport procedure as specified in subclause 5.4.5, the UE shall stop timer T3580 shall release the allocated PTI value and shall consider that the PDU session was not established.

If the PDU SESSION ESTABLISHMENT REQUEST message was sent with request type set to "initial emergency request" or "existing emergency PDU session" and the UE receives a PDU SESSION ESTABLISHMENT REJECT message, then the UE may:

a) inform the upper layers of the failure of the procedure; or

NOTE 2: This can result in the upper layers requesting another emergency call attempt using domain selection as specified in 3GPP TS 23.167 [6].

b) de-register locally, if not de-registered already, attempt initial registration for emergency services.

If the PDU SESSION ESTABLISHMENT REJECT message includes 5GSM cause #39 "reactivation requested" and the PDU session is being transferred from EPS to 5GS and established with the request type set to "existing PDU session", the UE should re-initiate the UE-requested PDU session establishment procedure as specified in subclause 6.4.1 for:

a) the PDU session type associated with the transferred PDU session;

b) the SSC mode associated with the transferred PDU session;

c) the DNN associated with the transferred PDU session; and

d) the S-NSSAI associated with (if available in roaming scenarios) a mapped S-NSSAI if provided in the UE-requested PDU session establishment procedure of the transferred PDU session.

If the PDU SESSION ESTABLISHMENT REJECT message includes 5GSM cause #86 "UAS services not allowed" and the UE has not included the service-level device ID in the Service-level-AA container IE of the PDU SESSION ESTABLISHMENT REQUEST message and set the value to the CAA-level UAV ID:

a) the UE shall not send another PDU SESSION ESTABLISHMENT REQUEST message for UAS services without including the CAA-level UAV ID in the service-level device ID of the Service-level-AA container IE; and

b) upon receipt of the request from the upper layers to establish a PDU session for UAS services, the UE shall initiate the UE-requested PDU session establishment procedure by including the service-level device ID in the Service-level-AA container IE of the PDU SESSION ESTABLISHMENT REQUEST message and set the value to the CAA-level UAV ID as specified in subclause 6.4.1.2.

\* \* \* 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 | | | 1 | | |  | | | PTI already in use | |
| 0 | 0 | | | 1 | | | 0 | | | 0 | | | 1 | | | 0 | | | 0 | | |  | | | Regular deactivation | |
| 0 | 0 | | | 1 | | | 0 | | | 0 | | | 1 | | | 0 | | | 1 | | |  | | | 5GS QoS not accepted | |
| 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 | | | 0 | | | 1 | | | 1 | | | 0 | | |  | | | UAS services not allowed |
| 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 0001 1111, " Request rejected, unspecified ". 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 #37 – 5GS QoS not accepted

This 5GSM cause is used by the network if the new 5GS QoS that was indicated in the UE request cannot be accepted.

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 at handover of a PDU session between non-3GPP access and 3GPP access, or at interworking of a PDN connection from non-3GPP access network connected to EPC or from E-UTRAN connected to EPC to a PDU session, to indicate that the network does not have any information about the requested PDU session.

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 or maximum number of PDU sessions on a specific slice has been already reached.

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.

Cause #86 – UAS services not allowed

This 5GSM cause is used by the network to indicate that the requested UAS services are not allowed.

\* \* \* End of Change \* \* \* \*