**3GPP TSG-CT WG1 Meeting #125-eC1-20xxxx**

**Electronic meeting, 20-28 August 2020 (Revision of C1-204566)**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
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|  | **24.501** | **CR** | **2419** | **rev** | **1** | **Current version:** | **16.5.1** |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

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| ***Title:***  | Remove #43 in PDU session modification command not accepted by UE |
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| ***Source to WG:*** | OPPO |
| ***Source to TSG:*** | C1 |
|  |  |
| ***Work item code:*** | 5GProtoc16 |  | ***Date:*** | 2020-7-15 |
|  |  |  |  |  |
| ***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)* |
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| ***Reason for change:*** | There is a case where UE cannot accept the PDU session modification command since the identified PDU session is inactive in UE. For this case, in subclause 6.3.2.4, the following behaviour is mentioned:The UE shall set the 5GSM cause IE of the PDU SESSION MODIFICATION COMMAND REJECT message to indicate the reason for rejecting the PDU session modification.The 5GSM cause IE typically indicates one of the following 5GSM cause values:#26 insufficient resources;**#43 invalid PDU session identity**;Howerver, according to subclause 7.3.2 as following, UE will response 5GSM STATUS message with #43 :b) If the UE receives a 5GSM message which includes a PDU session identity belonging to any PDU session in state PDU SESSION INACTIVE in the UE, the UE shall respond with a 5GSM STATUS message including 5GSM cause #43 "invalid PDU session identity".Therfore, UE will not send PDU SESSION MODIFICATION COMMAND REJECT message with #43.  |
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| ***Summary of change:*** | Remove #43 related descripiton in NW-initiated PDU session modification procedure. |
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| ***Consequences if not approved:*** | The desciption for #43 in NW-initiated PDU session modification procedure and 5GSM status procedure misalign. |
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| ***Clauses affected:*** | 6.3.2.4 |
|  |  |
|  | **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 of change \*\*\*\*\*

#### 6.3.2.4 Network-requested PDU session modification procedure not accepted by the UE

Upon receipt of a PDU SESSION MODIFICATION COMMAND message and a PDU session ID, using the NAS transport procedure as specified in subclause 5.4.5, if the UE rejects the PDU SESSION MODIFICATION COMMAND message, the UE shall create a PDU SESSION MODIFICATION COMMAND REJECT message.

If the PDU SESSION MODIFICATION COMMAND message contains the PTI value allocated in the UE-requested PDU session modification procedure, the UE shall stop the timer T3581. The UE should ensure that the PTI value assigned to this procedure is not released immediately.

NOTE 1: The way to achieve this is implementation dependent. For example, the UE can ensure that the PTI value assigned to this procedure is not released during the time equal to or greater than the default value of timer T3591.

While the PTI value is not released, the UE regards any received PDU SESSION MODIFICATION COMMAND message with the same PTI value as a network retransmission (see subclause 7.3.1).

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

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

#26 insufficient resources;

#44 semantic error in packet filter(s);

#45 syntactical error in packet filter(s);

#83 semantic error in the QoS operation; or

#84 syntactical error in the QoS operation.

If the selected SSC mode of the PDU session is "SSC mode 3" and the PDU SESSION MODIFICATION COMMAND messages includes 5GSM cause #39 "reactivation requested", while the UE does not have sufficient resources for initiating the PDU session establishment procedure as specified in subclause 6.4.1 then the UE shall set cause IE to #26 "insufficient resources".

If the PDU SESSION MODIFICATION COMMAND message includes a request to add a new authorized QoS rule, or a request to modify the authorized QoS rules, or both, and the UE decides to reject the request due to e.g. the supported number of authorized QoS rules or number of packet filters associated with a PDU session having reached the maximum number, then the UE shall set the 5GSM cause IE to #26 "insufficient resources".

NOTE 2: The maximum number of supported authorized QoS rules or packet filters associated with a PDU session is implementation specific.

If the PDU SESSION MODIFICATION COMMAND message includes a request to add a new authorized QoS flow description, or a request to modify the authorized QoS flow descriptions, or both and the UE decides to reject the request due to e.g. the supported number of authorized QoS flow descriptions, then the UE shall set the 5GSM cause IE to #26 "insufficient resources".

NOTE 3: The maximum number of supported authorized QoS flow descriptions associated with a PDU session is implementation specific.

If the PDU SESSION MODIFICATION COMMAND message includes the Authorized QoS rules IE, the UE shall process the QoS rules sequentially starting with the first QoS rule. The UE shall check the QoS rule and the QoS flow description provided in the PDU SESSION MODIFICATION COMMAND message for different types of errors as follows:

NOTE 4: If an error is detected in a QoS rule or a QoS flow description which requires rejecting the PDU SESSION MODIFICATION COMMAND message, then the Authorized QoS rules IE, the Authorized QoS flow descriptions IE and the Mapped EPS bearer contexts IE included in the PDU SESSION MODIFICATION COMMAND message are discarded, if any.

a) Semantic errors in QoS operations:

1) When the rule operation is "Modify existing QoS rule and add packet filters", "Modify existing QoS rule and replace all packet filters", "Modify existing QoS rule and delete packet filters" or "Modify existing QoS rule without modifying packet filters" on the default QoS rule and the DQR bit is set to "the QoS rule is not the default QoS rule".

2) When the rule operation is "Modify existing QoS rule and add packet filters", "Modify existing QoS rule and replace all packet filters", "Modify existing QoS rule and delete packet filters" or "Modify existing QoS rule without modifying packet filters" on a QoS rule which is not the default QoS rule and the DQR bit is set to "the QoS rule is the default QoS rule".

3) When the rule operation is "Create new QoS rule" and the DQR bit is set to "the QoS rule is the default QoS rule" when there's already a default QoS rule with different QoS rule identifier.

4) When the rule operation is "Delete existing QoS rule" on the default QoS rule.

5) When the rule operation is "Create new QoS rule", "Modify existing QoS rule and add packet filters", "Modify existing QoS rule and replace all packet filters", "Modify existing QoS rule and delete packet filters ", or "Modify existing QoS rule without modifying packet filters" and two or more QoS rules associated with this PDU session would have identical precedence values, and the UE is not in NB-N1 mode.

6) When the rule operation is "Modify existing QoS rule and delete packet filters", the QoS rule is a QoS rule of a PDU session of IPv4, IPv6, IPv4v6 or Ethernet PDU session type, and the packet filter list in the resultant QoS rule is empty.

7) When the rule operation is "Create new QoS rule", there is already an existing QoS rule with the same QoS rule identifier and the UE is not in NB-N1 mode.

8) When the rule operation is "Modify existing QoS rule and add packet filters", "Modify existing QoS rule and replace all packet filters", "Modify existing QoS rule and delete packet filters" or "Modify existing QoS rule without modifying packet filters", the associated QoS rule does not exist and the UE is not in NB-N1 mode.

9) When the rule operation is different than "Delete existing QoS rule", the DQR bit of the QoS rule is set to "the QoS rule is not the default QoS rule" and the UE is in NB-N1 mode.

10) When the rule operation is "Delete existing QoS rule" and there is no existing QoS rule with the same QoS rule identifier.

11) When the flow description operation is "Create new QoS flow description", there is already an existing QoS flow description with the same QoS flow identifier and the UE is not in NB-N1 mode.

12) When the flow description operation is "Modify existing QoS flow description", the associated QoS flow description does not exist and the UE is not in NB-N1 mode.

13) When the flow description operation is "Delete existing QoS flow description" and there is no existing QoS flow description with the same QoS flow identifier.

14) When the flow description operation is different than "Delete existing QoS flow description", the QFI is not the same as the QFI of the default QoS rule and the UE is in NB-N1 mode.

 In case 4, the UE shall initiate a PDU session release procedure by sending a PDU SESSION RELEASE REQUEST message with 5GSM cause #83 "semantic error in the QoS operation".

 In case 5, if the old QoS rule (i.e. the QoS rule that existed before the PDU SESSION MODIFICATION COMMAND message was received) is not the default QoS rule, the UE shall not diagnose an error, shall further process the new request and, if it was processed successfully, shall delete the old QoS rule which has identical precedence value. Furthermore, after sending the PDU SESSSION MODIFICATION COMPLETE for the ongoing PDU session modification procedure, the UE shall send a PDU SESSION MODIFICATION REQUEST message with 5GSM cause #83 "semantic error in the QoS operation" to delete the QoS rule.

 In case 5, if the old QoS rule (i.e. the QoS rule that existed before the PDU SESSION MODIFICATION COMMAND message was received) is the default QoS rule, the UE shall initiate a PDU session release procedure by sending a PDU SESSION RELEASE REQUEST message with 5GSM cause #83 "semantic error in the QoS operation".

 In case 6, if the QoS rule is not the default QoS rule, after sending the PDU SESSSION MODIFICATION COMPLETE for the ongoing PDU session modification procedure, the UE shall send a PDU SESSION MODIFICATION REQUEST message with 5GSM cause #83 "semantic error in the QoS operation" to delete the QoS rule.

 In case 6, if the QoS rule is the default QoS rule, the UE shall initiate a PDU session release procedure by sending a PDU SESSION RELEASE REQUEST message with 5GSM cause #83 "semantic error in the QoS operation".

 In case 7, if the existing QoS rule is not the default QoS rule and the DQR bit of the new QoS rule is set to "the QoS rule is not the default QoS rule", the UE shall not diagnose an error, further process the create request and, if it was processed successfully, delete the old QoS rule. If the existing QoS rule is the default QoS rule or the DQR bit of the new QoS rule is set to "the QoS rule is the default QoS rule", the UE shall reject the PDU SESSION MODIFICATION COMMAND message with 5GSM cause #83 "semantic error in the QoS operation".

 In case 9, after sending the PDU SESSSION MODIFICATION COMPLETE for the ongoing PDU session modification procedure, the UE shall send a PDU SESSION MODIFICATION REQUEST message with 5GSM cause #83 "semantic error in the QoS operation" to delete the QoS rule.

 In case 10, the UE shall not diagnose an error, further process the delete request and, if it was processed successfully, consider the respective QoS rule as successfully deleted.

 In case 11, the UE shall not diagnose an error, further process the create request and, if it was processed successfully, delete the old QoS flow description.

 In case 13, the UE shall not diagnose an error, further process the delete request and, if it was processed successfully, consider the respective QoS flow description as successfully deleted.

 In case 14, after sending the PDU SESSSION MODIFICATION COMPLETE for the ongoing PDU session modification procedure, the UE shall send a PDU SESSION MODIFICATION REQUEST message with 5GSM cause #83 "semantic error in the QoS operation" to delete the QoS flow description.

 Otherwise, the UE shall reject the PDU SESSION MODIFICATION COMMAND message with 5GSM cause #83 "semantic error in the QoS operation".

b) Syntactical errors in QoS operations:

1) When the rule operation is "Create new QoS rule", "Modify existing QoS rule and add packet filters", "Modify existing QoS rule and replace all packet filters" or "Modify existing QoS rule and delete packet filters" and the packet filter list in the QoS rule is empty.

2) When the rule operation is "Delete existing QoS rule" or "Modify existing QoS rule without modifying packet filters" with a non-empty packet filter list in the QoS rule.

3) When the rule operation is "Modify existing QoS rule and delete packet filters" and the packet filter to be deleted does not exist in the original QoS rule.

4) Void.

5) When there are other types of syntactical errors in the coding of the QoS rules IE, such as a mismatch between the number of packet filters subfield, and the number of packet filters in the packet filter list.

6) When, the

A) rule operation is "Create new QoS rule", "Modify existing QoS rule and add packet filters", "Modify existing QoS rule and replace all packet filters", "Modify existing QoS rule and delete packet filters" or "Modify existing QoS rule without modifying packet filters", the UE determines that there is a resulting QoS rule for a GBR QoS flow (as described in 3GPP TS 23.501 [8] table 5.7.4-1), and there is no QoS flow description with a QFI corresponding to the QFI of the resulting QoS rule.

B) flow description operation is "Delete existing QoS flow description", and the UE determines that there is a resulting QoS rule for a GBR QoS flow (as described in 3GPP TS 23.501 [8] table 5.7.4-1) with a QFI corresponding to the QFI of the QoS flow description that is deleted (i.e. there is no associated QoS flow description with the same QFI).

7) When the flow description operation is "Create new QoS flow description" or "Modify existing QoS flow description", and the UE determines that there is a QoS flow description of a GBR QoS flow (as described in 3GPP TS 23.501 [8] table 5.7.4-1) which lacks at least one of the mandatory parameters (i.e., GFBR uplink, GFBR downlink, MFBR uplink and MFBR downlink).

 In case 3 the UE shall not diagnose an error, further process the deletion request and, if no error according to items c and d was detected, consider the respective packet filter as successfully deleted.

 In case 6, if the QoS rules IE contains at least one other valid QoS rule, the UE shall not diagnose an error and shall further process the request, if no error according to items c and d was detected. After completion of the PDU session modification procedure, the UE shall delete the QoS rule for which no corresponding QoS flow description is available and initiate UE requested PDU session modification procedure with 5GSM cause #84 "syntactical error in the QoS operation" to delete the QoS rule for which it has deleted.

 In case 7, if the default QoS rule is associated with the QoS flow description which lacks at least one of the mandatory parameters, after completion of the PDU session modification procedure, the UE shall initiate a PDU session release procedure by sending a PDU SESSION RELEASE REQUEST message with 5GSM cause #84 "syntactical error in the QoS operation". Otherwise, if the QoS rules IE contains at least one other valid QoS rule or the QoS flow description IE contains at least one other valid QoS flow description, the UE shall not diagnose an error and shall further process the request, if no error according to items c and d was detected. After completion of the PDU session modification procedure, the UE shall delete the QoS flow description which lacks at least one of the mandatory parameters and the associated QoS rule(s), if any, and initiate UE requested PDU session modification procedure with 5GSM cause #84 "syntactical error in the QoS operation" to delete the QoS flow description and the associated QoS rule(s), if any, which it has deleted.

 Otherwise the UE shall reject the PDU SESSION MODIFICATION COMMAND message with 5GSM cause #84 "syntactical error in the QoS operation".

c) Semantic errors in packet filters:

1) When a packet filter consists of conflicting packet filter components which would render the packet filter ineffective, i.e. no IP packet will ever fit this packet filter. How the UE determines a semantic error in a packet filter is outside the scope of the present document.

 The UE shall reject the PDU SESSION MODIFICATION COMMAND message with 5GSM cause #44 "semantic error in packet filter(s)".

d) Syntactical errors in packet filters:

1) When the rule operation is "Create new QoS rule", "Modify existing QoS rule and add packet filters" or "Modify existing QoS rule and replace all packet filters", and two or more packet filters in the resultant QoS rule would have identical packet filter identifiers.

2) When there are other types of syntactical errors in the coding of packet filters, such as the use of a reserved value for a packet filter component identifier.

 In case 1, if two or more packet filters with identical packet filter identifiers are contained in the PDU SESSION MODIFICATION COMMAND message, the UE shall reject the PDU SESSION MODIFICATION COMMAND with 5GSM cause #45 "syntactical errors in packet filter(s)". Otherwise, the UE shall not diagnose an error, further process the PDU SESSION MODIFICATION COMMAND message and, if it was processed successfully, replace the old packet filter with the new packet filter which have the identical packet filter identifiers.

 Otherwise the UE shall reject the PDU SESSION MODIFICATION COMMAND message with 5GSM cause #45 "syntactical errors in packet filter(s)".

If:

a) the UE detects errors in QoS rules that require to delete at least one QoS rule as described above which requires sending a PDU SESSION MODIFICATION REQUEST message to delete the erroneous mapped EPS bearer contexts; and

b) optionally, if the UE detects different errors in the mapped EPS bearer contexts as described in subclause 6.3.2.3 which requires sending a PDU SESSION MODIFICATION REQUEST message to delete the erroneous QoS rules;

the UE, after sending the PDU SESSSION MODIFICATION COMPLETE message for the ongoing PDU session modification procedure, may send a single PDU SESSION MODIFICATION REQUEST message to delete the erroneous QoS rules, and optionally to delete the erroneous mapped EPS bearer contexts. The UE shall include a 5GSM cause IE in the PDU SESSION MODIFICATION REQUEST message.

NOTE 5: The 5GSM cause to use cannot be different from #41 "semantic error in the TFT operation", #42 "syntactical error in the TFT operation", #44 "semantic error in packet filter(s)", #45 "syntactical errors in packet filter(s)", #83 "semantic error in the QoS operation", #84 "syntactical error in the QoS operation", or #85 "Invalid mapped EPS bearer identity". The selection of a 5GSM cause is up to UE implementation.

The UE shall transport the PDU SESSION MODIFICATION COMMAND REJECT message and the PDU session ID, using the NAS transport procedure as specified in subclause 5.4.5.

Upon receipt of a PDU SESSION MODIFICATION COMMAND REJECT message with 5GSM cause value in state PDU SESSION MODIFICATION PENDING, the SMF shall stop timer T3591, enter the state PDU SESSION ACTIVE and abort the PDU session modification procedure.

\*\*\*\*\* Second of change \*\*\*\*\*

#### 6.3.2.5 Abnormal cases on the network side

The following abnormal cases can be identified:

a) Expiry of timer T3591.

 On the first expiry of the timer T3591, the SMF shall resend the PDU SESSION MODIFICATION COMMAND message and shall reset and restart timer T3591. This retransmission is repeated four times, i.e. on the fifth expiry of timer T3591, the SMF shall abort the procedure and enter the state PDU SESSION ACTIVE.

 The SMF may continue to use the previous configuration of the PDU session or initiate the network-requested PDU session release procedure. If the SMF decides to continue to use the previous configuration of the PDU session and

i) the authorized QoS rules IE is included in the PDU SESSION MODIFICATION COMMAND message, the SMF may mark the corresponding authorized QoS rule(s) of the PDU session as to be synchronised with the UE; and

ii) the authorized QoS flow descriptions IE is included in the PDU SESSION MODIFICATION COMMAND message, the SMF may mark the corresponding authorized QoS flow description(s) of the PDU session as to be synchronised with the UE.

b) Void.

c) Collision of UE-requested PDU session release procedure and network-requested PDU session modification procedure.

 If the SMF receives a PDU SESSION RELEASE REQUEST message during the network-requested PDU session modification procedure, and the PDU session indicated in the PDU SESSION RELEASE REQUEST message is the PDU session that the SMF had requested to modify, the SMF shall abort the PDU session modification procedure and proceed with the UE-requested PDU session release procedure.

d) Collision of UE-requested PDU session modification procedure and network-requested PDU session modification procedure.

 If the network receives a PDU SESSION MODIFICATION REQUEST message during the network-requested PDU session modification procedure, and the PDU session indicated in the PDU SESSION MODIFICATION REQUEST message is the PDU session that the network had requested to modify, the network shall ignore the PDU SESSION MODIFICATION REQUEST message received in the state PDU SESSION MODIFICATION PENDING. The network shall proceed with the network-requested PDU session modification procedure as if no PDU SESSION MODIFICATION REQUEST message was received from the UE.

e) 5G access network cannot forward the message.

 If the SMF determines based on content of the n2SmInfo attribute specified in 3GPP TS 29.502 [20A] that the DL NAS TRANSPORT message carrying the PDU SESSION MODIFICATION COMMAND message was not forwarded to the UE by the 5G access network, then the SMF shall abort the procedure and enter the state PDU SESSION ACTIVE.

f) 5G access network cannot forward the message due to handover.

 If the SMF determines based on content of the n2SmInfo attribute specified in 3GPP TS 29.502 [20A] that the DL NAS TRANSPORT message carrying the PDU SESSION MODIFICATION COMMAND message was not forwarded to the UE by the 5G access network due to handover, then the SMF shall abort the procedure and enter the state PDU SESSION ACTIVE.

 The SMF may re-initiate, up to a pre-configured number of times, the network-requested PDU session modification procedure when the SMF detects that the handover is completed successfully or has failed or at the expiry of the configured guard timer as specified in 3GPP TS 23.502 [9].

\*\*\*\*\* End of changes \*\*\*\*\*