**3GPP TSG-CT1 Meeting #123-e *C1-202430***

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

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
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|  | **24.501** | **CR** | **2168** | **rev** | **-** | **Current version:** | **16.4.1** |  |
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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 | **X** | Radio Access Network |  | Core Network | **X** |

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| ***Title:***  | Release PDU sessions due to revocation from AAA server, re-auth failure |
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| ***Source to WG:*** | LG Electronics  |
| ***Source to TSG:*** | C1 |
|  |  |
| ***Work item code:*** | eNS |  | ***Date:*** | 2020-02-13 |
|  |  |  |  |  |
| ***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:*** | In the SA#137 e-meeting, S2-2002360 is agreed.It describes that a PDU session is released when * Case 1) due to a change of the set of network slices for a UE where a network slice instance is no longer available as described in TS 23.501 [2] clause 5.15.5.2.2 or
* Case 2) the AAA Server triggered Network Slice-Specific Re-authentication and Re-authorization procedure fails as specified in clause 4.2.9.2 or
* Case 3) the AAA Server triggered Slice-Specific Authorization Revocation takes place as specified in clause 4.2.9.4

This PDU session release procedure is triggered by a AMF. The AMF indicates to a SMF why the PDU session is released with a specific error cause IE using Nsmf\_PDUSession\_UpdateSMContext Request.Followings are reason for trigger for PDU session release and error cause IE as described in TS29.502 clause 5.2.2.3.17 and clause 5.2.2.3.12.Case 1)* AMF requested PDU Session Release due to slice not available
* Error cause IE : REL\_DUE\_TO\_SLICE\_NOT\_AVAILABLE

Case 2)* AMF requested PDU Session Release due to Network Slice-Specific Authentication and Authorization failure or revocation
* Error cause IE : REL\_DUE\_TO\_SLICE\_NOT\_AUTHORIZED

PDU session release cause is significant different Case 1),2) and Case 3).So, Two different error causes are needed. But still, TS24.501 haven’t mentioned yet above requirement. So, addressing above requiement from SA2 and CT4 in TS24.501 is needed. |
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| ***Summary of change:*** | For case 2) and 3), similar error cause is existed in TS24.501 in #29 “user authentication or authorization failed”.So, we added additional description of #29 error cause with “it is indicated when failed or revoked NSSAA by the AAA server”.For case 1), there is no existing 5GSM cause value mapped to case 1). So, we added new 5GSM cause value which indicates the change of the set of network slices for a UE where a network slice instance is no longer available. |
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| ***Consequences if not approved:*** | It is ambiguous that which cause value is used in case of release of PDU sessions due to revocation from AAA server, re-auth failure or change the set of Network Slices. |
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| ***Clauses affected:*** |  |
|  |  |
|  | **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:*** | 6.3.3.2, Annex B.1 |
|  |  |
| ***This CR's revision history:*** | Rev 1. * Network
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#### \*\*\*\*\* First change \*\*\*\*\*

#### 6.3.3.2 Network-requested PDU session release procedure initiation

In order to initiate the network-requested PDU session release procedure, the SMF shall create a PDU SESSION RELEASE COMMAND message.

The SMF shall set the 5GSM cause IE of the PDU SESSION RELEASE COMMAND message to indicate the reason for releasing the PDU session.

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

#8 operator determined barring;

#26 insufficient resources;

#29 user authentication or authorization failed;

#36 regular deactivation;

#38 network failure;

#39 reactivation requested;

#46 out of LADN service area;

#67 insufficient resources for specific slice and DNN;

#69 insufficient resources for specific slice;

#xx set of network slices is no longer available due to a change of the set of network slices for a UE.

If the selected SSC mode of the PDU session is "SSC mode 2" and the SMF requests the relocation of SSC mode 2 PDU session anchor with different PDU sessions as specified in 3GPP TS 23.502 [9], the SMF shall include 5GSM cause #39 "reactivation requested".

If the network-requested PDU session release procedure is triggered by a UE-requested PDU session release procedure, the SMF shall set the PTI IE of the PDU SESSION RELEASE COMMAND message to the PTI of the PDU SESSION RELEASE REQUEST message received as part of the UE-requested PDU session release procedure.

If the network-requested PDU session release procedure is not triggered by a UE-requested PDU session release procedure, the SMF shall set the PTI IE of the PDU SESSION RELEASE COMMAND message to "No procedure transaction identity assigned".

Based on the local policy and user's subscription data, if the SMF decides to release the PDU session after determining 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 shall:

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

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

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

If the SMF receives an event notification from the AMF that the UE is out of the LADN service area and the SMF decides to release the PDU session, the SMF shall include the 5GSM cause value #46 "out of LADN service area" in the 5GSM cause IE of the PDU SESSION RELEASE COMMAND message. Upon receipt of the 5GSM cause value #46 "out of LADN service area" in the 5GSM cause IE of the PDU SESSION RELEASE COMMAND message, the UE shall release the PDU session.

The SMF may include a Back-off timer value IE in the PDU SESSION RELEASE COMMAND message when the 5GSM cause value #26 "insufficient resources" is included in the PDU SESSION RELEASE COMMAND message. If the 5GSM cause value is #26 "insufficient resources" and the PDU SESSION RELEASE COMMAND message is sent to a UE configured for high priority access in selected PLMN or the request type was set to "initial emergency request" or "existing emergency PDU session" for the establishment of the PDU session, the network shall not include a Back-off timer value IE.

The SMF may include a Back-off timer value IE in the PDU SESSION RELEASE COMMAND message when the 5GSM cause value #67 "insufficient resources for specific slice and DNN" is included in the PDU SESSION RELEASE COMMAND message. If the 5GSM cause value is #67 "insufficient resources for specific slice and DNN" and the PDU SESSION RELEASE COMMAND message is sent to a UE configured for high priority access in selected PLMN or the request type was set to "initial emergency request" or "existing emergency PDU session" for the establishment of the PDU session, the network shall not include a Back-off timer value IE.

The SMF may include a Back-off timer value IE in the PDU SESSION RELEASE COMMAND message when the 5GSM cause #69 "insufficient resources for specific slice" is included in the PDU SESSION RELEASE COMMAND message. If the 5GSM cause value is #69 "insufficient resources for specific slice" and the PDU SESSION RELEASE COMMAND message is sent to a UE configured for high priority access in selected PLMN or the request type was set to "initial emergency request" or "existing emergency PDU session" for the establishment of the PDU session, the network shall not include a Back-off timer value IE.

The SMF shall send:

a) the PDU SESSION RELEASE COMMAND message; and

b) the N1 SM delivery skip allowed indication:

1) if the SMF allows the AMF to skip sending the N1 SM container to the UE and the 5GSM cause IE is not set to #39 "reactivation requested"; or

2) if the SMF allows the AMF to skip sending the N1 SM container to the UE and the Access type IE is not set to "3GPP access" or "non-3GPP access"

towards the AMF, and the SMF shall start timer T3592 (see example in figure 6.3.3.2.1).



Figure 6.3.3.2.1: Network-requested PDU session release procedure

\*\*\*\*\* Next Change \*\*\*\*\*

Annex B (informative):
Cause values for 5GS session management

## 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, rejected by 5GCN due to a failed user authentication or authorization or failed re-authentication and re-authorization or revoked NSSAA by the AAA server.

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 #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.

Cause #xx – set of network slices is no longer available due to a change of the set of network slices for a UE

This 5GSM cause is used by the network to indicate that there is a change of the set of network slices for a UE where a network slice instance is no longer available (as described in 3GPP TS 23.501 [2], clause 5.15.5.2.2) and the PDU session is not activated

\*\*\*\*\* End of Changes \*\*\*\*\*