**3GPP TSG-CT WG1 Meeting #133e-bisC1-22xxxx was0149**

**E-meeting, 17-21 January 2022**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **24.501** | **CR** | **3855** | **rev** | **1** | **Current version:** | **17.5.0** |  |
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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 |  | Radio Access Network |  | Core Network | **X** |

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| ***Title:***  | PDU session establishment reject for network slice data rate control |
|  |  |
| ***Source to WG:*** | Ericsson |
| ***Source to TSG:*** | C1 |
|  |  |
| ***Work item code:*** | eNS\_Ph2 |  | ***Date:*** | 2022-01-10 |
|  |  |  |  |  |
| ***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 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-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
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| ***Reason for change:*** | Stage-2 TS 23.503 has defined the PCF based network slice data rate control in clause 6.1.4.1, clause 6.2.1.9 and clause 6.2.1.10. Based on below SA2 text in details:*"The PCF monitors the data rate of the network slice and ensures that it does not exceed the Maximum Slice Data Rate for that network slice by e.g. rejecting new SM Policy Associations, rejecting new GBR service data flows with high GBR requirements, changing the Authorized Session-AMBR values (if allowed by the HPLMN), changing the MBR values in PCC rules belonging to GBR service data flows or other actions depending on operator policies."*The network applies network slice related policy control which supports limitation of the data rate per network slice and/or per network slice per UE, and may reject the PDU session establishment based on the data rate of the network slice(per UE). And CT3 introduced 2 HTTP status code/application error "403 Forbidden"/"EXCEEDED\_SLICE\_DATA\_RATE” and "403 Forbidden"/"EXCEEDED\_UE\_SLICE\_DATA\_RATE" for this sceanrio in CT3 #118e meeting in [C3-215329](https://www.3gpp.org/ftp/tsg_ct/WG3_interworking_ex-CN3/TSGC3_118e/Inbox/C3-215329.zip) and [C3-215364](https://www.3gpp.org/ftp/tsg_ct/WG3_interworking_ex-CN3/TSGC3_118e/Inbox/C3-215364.zip).Hence, the SA2 requirement shall be reflected in 24.501. |
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| ***Summary of change:*** | Add handling for PDU session establishment reject due to PCF based network slice data rate control. |
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| ***Consequences if not approved:*** | PDU session establishment reject for PCF based network slice data rate control is unspecified. |
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| ***Clauses affected:*** | 4.6.3.x(new), B.1 |
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|  | **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 Change \* \* \* \*

### 4.6.3.x Session management based network slice data rate limitation control

A serving PLMN or the HPLMN can perform network slice data rate limitation control for the S-NSSAI(s) subject to network slice data rate limitation control to monitor and control the total data rate of established PDU sessions per network slice. The network can perform network slice data rate limitation control on the S-NSSAI during the PDU session establishment procedure. If the maximum data rate of PDU sessions on a network slice associated with an S-NSSAI has been exceeded, the SMF may reject the PDU session establishment request using S-NSSAI based congestion control as specifed in clause 6.2.8 and 6.4.1.4.2.

A serving PLMN or the HPLMN can perform management of Slice-Maximum Bit Rate per UE (UE-Slice-MBR). The network may retrieve for the UE and S-NSSAI to which the PDU session is allocated the UE-Slice-MBR and monitor the data rate for this S-NSSAI and UE. If the UE-Slice-MBR is exceeded, the network may reject the PDU session eatablishment request using S-NSSAI based congestion control as specifed in clause 6.2.8 and 6.4.1.4.2.

\* \* \* 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, maximum number of PDU sessions on a specific slice has been already reached, data rate on a specific slice has been exceeded, or UE-Slice-MBR has been exceeded.

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 Changes \* \* \* \*