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

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

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
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|  | **24.301** | **CR** | **3618** | **rev** | **1** | **Current version:** | **17.4.1** |  |
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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 |  |

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| ***Title:***  | UAS services not allowed indication in EPS NAS message |
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| ***Source to WG:*** | Huawei, HiSilicon |
| ***Source to TSG:*** | C1 |
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| ***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 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:*** | As per current stage 2 requirements on C2 authorization in EPS specified in TS 23.256 sub 5.2.5.3.1 as below, the yellow text indicates that the SMF+PGW-C needs to reject the PDN connectivity request and provides in PCO an indication that USS authorization is required:" *For a UAV with aerial subscription, if the SMF+PGW-C determines that the S-NSSAI is subject to C2 authorization and the UAV has not provided a CAA-Level UAV ID then the SMF+PGW-C rejects the PDN connectivity request and provides in PCO an indication that USS authorization is required.*"Even stage 2 specified that “*an indication that USS authorization is required*”, but from stage 3 implementation perspective, the final result at the UE is the requested UAS services are not allowed by the network due to the required authentication or authorization for UAS services is not performed. Considering stage 3 has already dedicated define a new NAS cause value for UAS serivces, i.e. "UAS services not allowed", then to avoid adding so many new NAS cause values or indications just for a single UAS feature, it is better to reuse the cause value "UAS services not allowed" used for UUAA as such indicaton included in PCO. Based on this indication, the UE can act that if it wants to obtain C2 communication services, it needs to provide the required information (e.g. CAA-level UAV ID or C2 aviation payload) to the network.Note that currently SA2 only specified above text for C2 authorization in EPS, but from stage 3 implementation perspective, in the similar case for UUAA-SM (i.e. SMF+PGW-C determines that UUAA-SM is required but no CAA-level UAV ID is received from the UE), the SMF+PGW-C needs also" *rejects the PDN connectivity request and provides in PCO an indication that USS authorization is required* "Furthermore, as shown in the discussion paper C1-216569, about new PCO parameter vs. new field in Service-level-AA container to denote such network indication for PDN connectivity rejection, it is preferred to denote such network indication for PDN connectivity rejection as a new PCO parameter, rather than a new field in Service-level-AA container.At the UE side, upon receipt of such network indication in ePCO IE, the UE:1. shall not retry the **same** PDN connectivity 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 PDN connection for UAS services, the UE shall initiate a **new** UE-requested PDN connectivity 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. |
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| ***Summary of change:*** | It proposes for the UE, upon receipt of the network indication (UAS services not allowed) in ePCO IE of the PDN CONNECTIVITY REJECT message, the UE:1. shall not retry the **same** PDN connectivity 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 PDN connection for UAS services, the UE shall initiate a **new** UE-requested PDN connectivity procedure by including the CAA-level UAV ID.
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| ***Consequences if not approved:*** | Stage 2 requirement is not implemented in stage 3. |
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| ***Clauses affected:*** | 6.5.1.4.1 |
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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 ...  |
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| ***Other comments:*** |  |
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| ***This CR's revision history:*** |  |

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

##### 6.5.1.4.1 General

If connectivity with the requested PDN cannot be accepted by the network, the MME shall send a PDN CONNECTIVITY REJECT message to the UE. The message shall contain the PTI and an ESM cause value indicating the reason for rejecting the UE requested PDN connectivity.

The ESM cause IE typically indicates one of the following ESM cause values:

#8: operator determined barring;

#26: insufficient resources;

#27: missing or unknown APN;

#28: unknown PDN type;

#29: user authentication or authorization failed;

#30: request rejected by Serving GW or PDN GW;

#31: request rejected, unspecified;

#32: service option not supported;

#33: requested service option not subscribed;

#34: service option temporarily out of order;

#35: PTI already in use;

#38: network failure;

#50: PDN type IPv4 only allowed;

#51: PDN type IPv6 only allowed;

#53: ESM information not received;

#54: PDN connection does not exist;

#55: multiple PDN connections for a given APN not allowed;

#57: PDN type IPv4v6 only allowed;

#58: PDN type non IP only allowed;

#61: PDN type Ethernet only allowed;

#65: maximum number of EPS bearers reached;

#66: requested APN not supported in current RAT and PLMN combination;

#95 – 111: protocol errors;

#112: APN restriction value incompatible with active EPS bearer context;

#113: Multiple accesses to a PDN connection not allowed.

The network may include a Back-off timer value IE in the PDN CONNECTIVITY REJECT message. If the ESM cause value is #26 "insufficient resources" and the PDN CONNECTIVITY REQUEST message was received via a NAS signalling connection established with RRC establishment cause "High priority access AC 11 – 15" or the request type in the PDN CONNECTIVITY REQUEST message was set to "emergency" or "handover of emergency bearer services", the network shall not include a Back-off timer value IE.

If the Back-off timer value IE is included and the ESM cause value is different from #26 "insufficient resources", #50 "PDN type IPv4 only allowed", #51 "PDN type IPv6 only allowed", #57 "PDN type IPv4v6 only allowed", #58 "PDN type non IP only allowed", #61 "PDN type Ethernet only allowed", and #65 "maximum number of EPS bearers reached", the network may include the Re-attempt indicator IE to indicate:

- whether the UE is allowed to attempt a PDP context activation procedure in the PLMN for the same APN in A/Gb or Iu mode or a PDU session establishment procedure in the PLMN for the same APN in N1 mode; and

- whether another attempt in A/Gb and Iu mode, in S1 mode or in N1 mode is allowed in an equivalent PLMN.

If the ESM cause value is #50 "PDN type IPv4 only allowed", #51 "PDN type IPv6 only allowed", #57 "PDN type IPv4v6 only allowed", #58 "PDN type non IP only allowed" or #61 "PDN 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 PDN connectivity procedure in an equivalent PLMN for the same APN in S1 mode using the same PDN type.

If the ESM cause value is #66 "requested APN not supported in current RAT and PLMN combination", 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 PDN connectivity procedure in an equivalent PLMN for the same APN in S1 mode.

Upon receipt of the PDN CONNECTIVITY REJECT message, the UE shall stop timer T3482 and enter the state PROCEDURE TRANSACTION INACTIVE.

If the PDN CONNECTIVITY REJECT message is due to an ESM failure notified by EMM layer (i.e., EMM cause #19 "ESM failure" included in an ATTACH REJECT message), the UE may include a different APN in the PDN CONNECTIVITY REQUEST message.

NOTE 1: When receiving EMM cause #19 "ESM failure", coordination is required between the EMM and ESM sublayers in the UE to notify the ESM failure.

If the PDN CONNECTIVITY REQUEST message was sent with request type set to "emergency" or "handover of emergency bearer services" in a stand-alone PDN connectivity procedure and the UE receives a PDN CONNECTIVITY REJECT message, then the UE may:

a) inform the upper layers of the failure to establish the emergency bearer; or

NOTE 2: This can result in the upper layers requesting establishment of a CS emergency call (if not already attempted in the CS domain) or other implementation specific mechanisms, e.g. procedures specified in 3GPP TS 24.229 [13D] can result in the emergency call being attempted to another IP-CAN.

b) detach locally, if not detached already, attempt EPS attach for emergency bearer services.

If the PDN CONNECTIVITY REQUEST message was sent with PDN type set to "Ethernet" and the UE receives a PDN CONNECTIVITY REJECT message with ESM cause #58 "PDN type non IP only allowed", then the UE may attempt a PDN connectivity procedure with the non-IP PDN type.

If the PDN CONNECTIVITY REJECT message contains the UAS services not allowed indication parameter in the extended protocol configuration options IE and the UE has not provided its CAA-level UAV ID to the network in the PDN CONNECTIVITY REQUEST or ESM INFORMATION RESPONSE message:

a) the UE shall not send another PDN CONNECTIVITY REQUEST message for UAS services without providing its CAA-level UAV ID to the network; and

b) upon receipt of the request from the upper layers to establish a PDN connection for UAS services, the UE shall initiate the UE requested PDN connectivity procedure by providing its CAA-level UAV ID to the network in the PDN CONNECTIVITY REQUEST message as specified in subclause 6.5.4.2.

Editor's Note: It is FFS whether the protocol configuration options IE or the extended protocol configuration options IE is used in the PDN CONNECTIVITY REQUEST or ESM INFORMATION RESPONSE message to carry the UE's CAA-level UAV ID.

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