**3GPP TSG-CT WG1 Meeting #131-eC1-21XXXX**

**E-meeting, 19-27 August 2021**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **24.301** | **CR** | **3532** | **rev** | **3** | **Current version:** | **17.3.0** |  |
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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 | **X** | Radio Access Network |  | Core Network | **X** |

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| ***Title:*** | C2 pairing authorization at bearer resource modification | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Lenovo, Motorola Mobility, Qualcomm Incorporated | | | | | | | | | |
| ***Source to TSG:*** | C1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | ID\_UAS | | | | |  | ***Date:*** | | | 2021-08-19 |
|  |  | | | |  | |  | | |  |
| ***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)* | |
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| ***Reason for change:*** | | Stage 2 of C2 pairing authorization at the time of bearer resource modification is defined in clause 5.2.5.3.2 of TS 23.256. Stage 3 implementation is currently missing. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Adding abbreviations.  Adding requirements for C2 pairing authorization when modifying resource bearer. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Stage 3 of a feature is not implemented | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 3.2, 6.5.4.2, 6.5.4.3 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |

--------------------------------------- Next Change -------------------------------------

## 3.2 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [1].

5G-GUTI 5G-Globally Unique Temporary Identifier

5GMM 5GS Mobility Management

5GS 5G System

ACDC Application specific Congestion control for Data Communication

AKA Authentication and Key Agreement

AMBR Aggregate Maximum Bit Rate

APN Access Point Name

APN-AMBR APN Aggregate Maximum Bit Rate

ARP Allocation Retention Priority

BCM Bearer Control Mode

CIoT Cellular IoT

CP-CIoT Control Plane CIoT

CP-EDT Control Plane EDT

CSG Closed Subscriber Group

E-UTRA Evolved Universal Terrestrial Radio Access

E-UTRAN Evolved Universal Terrestrial Radio Access Network

EAB Extended Access Barring

ECM EPS Connection Management

eDRX Extended idle-mode DRX cycle

EDT Early Data Transmission

EENLV Extended Emergency Number List Validity

eKSI Key Set Identifier for E-UTRAN

EMM EPS Mobility Management

eNode B Evolved Node B

EPC Evolved Packet Core Network

EPS Evolved Packet System

ESM EPS Session Management

GBR Guaranteed Bit Rate

GUMMEI Globally Unique MME Identifier

GUTI Globally Unique Temporary Identifier

HeNB Home eNode B

HRPD High Rate Packet Data

IoT Internet of Things

IP-CAN IP-Connectivity Access Network

ISR Idle mode Signalling Reduction

kbps Kilobits per second

KSI Key Set Identifier

L-GW Local PDN Gateway

LHN-ID Local Home Network Identifier

LIPA Local IP Access

M-TMSI M-Temporary Mobile Subscriber Identity

Mbps Megabits per second

MBR Maximum Bit Rate

MME Mobility Management Entity

MMEC MME Code

MT-EDT Mobile Terminated-Early Data Transmission

MUSIM Multi-USIM

NB-IoT Narrowband IoT

NR New Radio

NSSAI Network Slice Selection Assistance Information

PD Protocol Discriminator

PDN GW Packet Data Network Gateway

ProSe Proximity-based Services

PSM Power Saving Mode

PTI Procedure Transaction Identity

QCI QoS Class Identifier

QoS Quality of Service

RACS Radio Capability Signalling Optimisation

RLOS Restricted Local Operator Services

ROHC RObust Header Compression

RRC Radio Resource Control

S-NSSAI Single NSSAI

S-TMSI S-Temporary Mobile Subscriber Identity

S101-AP S101 Application Protocol

S1AP S1 Application Protocol

SAE System Architecture Evolution

SCEF Service Capability Exposure Function

SGC Service Gap Control

SIPTO Selected IP Traffic Offload

TA Tracking Area

TAC Tracking Area Code

TAI Tracking Area Identity

TFT Traffic Flow Template

TI Transaction Identifier

TIN Temporary Identity used in Next update

UAV Uncrewed Aerial Vehicle

URN Uniform Resource Name

USS UAS Service Supplier

V2X Vehicle-to-Everything

WUS Wake-Up Signal

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#### 6.5.4.2 UE requested bearer resource modification procedure initiation

In order to request the modification of bearer resources for one traffic flow aggregate, the UE shall send a BEARER RESOURCE MODIFICATION REQUEST message to the MME, start timer T3481 and enter the state PROCEDURE TRANSACTION PENDING (see example in figure 6.5.4.2.1).

The UE shall include the EPS bearer identity of the EPS bearer associated with the traffic flow aggregate in the EPS bearer identity for packet filter IE.

To request a change of the GBR without changing the packet filter(s), the UE shall set the TFT operation code in the Traffic flow aggregate IE to "no TFT operation" and include the packet filter identifier(s) to which the change of the GBR applies in the Packet filter identifier parameter in the parameters list. The UE shall indicate the new GBR requested for the EPS bearer context in the Required traffic flow QoS IE.

To request a modification of a traffic flow aggregate, the UE shall set the TFT operation code in the Traffic flow aggregate IE to "Replace packet filters in existing TFT" or "Add packet filters to existing TFT". If the TFT operation code is set to "Add packet filters to existing TFT", the UE shall include in the parameter list one existing packet filter identifier to which the newly added packet filter(s) is linked. If the EPS bearer is a GBR bearer and the UE also wishes to request a change of GBR, the UE shall indicate the new GBR requested for the EPS bearer context in the Required traffic flow QoS IE.

To request a release of bearer resources, the UE shall set the TFT operation code in the Traffic flow aggregate IE to "Delete packet filters from existing TFT". If the EPS bearer is a GBR bearer and the UE does not request the release of all bearer resources, the UE shall indicate the new GBR requested for the EPS bearer context in the Required traffic flow QoS IE.

To request re-negotiation of header compression configuration associated to an EPS bearer context, the UE shall include the Header compression configuration IE in the BEARER RESOURCE MODIFICATION REQUEST message if the network indicated "Control plane CIoT EPS optimization supported" and "Header compression for control plane CIoT EPS optimization supported" in the EPS network feature support IE.

After an inter-system change from N1 mode to S1 mode, if:

a) the UE is operating in single-registration mode and has received the interworking without N26 interface indicator set to "interworking without N26 interface not supported" from the network;

b) the PDN type value of the PDN type IE is set to "IPv4", "IPv6" or "IPv4v6";

c) the UE indicates "Control plane CIoT EPS optimization supported" and "Header compression for control plane CIoT EPS optimization supported" in the UE network capability IE of the TRACKING AREA UPDATE REQUEST message; and

d) the network indicates "Control plane CIoT EPS optimization supported" and "Header compression for control plane CIoT EPS optimization supported" in the EPS network feature support IE of the TRACKING AREA UPDATE ACCEPT message;

the UE shall send a BEARER RESOURCE MODIFICATION REQUEST message to the MME and include the Header compression configuration IE to negotiate the header compression configuration.

To indicate a change of 3GPP PS data off UE status associated to a PDN connection, the UE shall include the protocol configuration options IE in the BEARER RESOURCE MODIFICATION REQUEST message and set the 3GPP PS data off UE status only if:

- the network included the 3GPP PS data off support indication in the protocol configuration options IE in the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message when the PDN connection was established; or

- the PDU session was established when in N1 mode.

The UE behaves as described in clause 6.3.10.

If the UE requests the modification of a traffic flow aggregate, which is assigned to a dedicated EPS bearer context, it shall ensure that at least one packet filter applicable for the uplink direction remains among the packet filters created on request from the UE in that TFT, or no own packet filters.

NOTE: If the UE requests the release of all bearer resources of a GBR bearer and includes a Required traffic flow QoS IE in the BEARER RESOURCE MODIFICATION REQUEST message, the network ignores the Required traffic flow QoS IE.

If the UE includes the Required traffic flow QoS IE, the UE shall set the QCI to the current QCI value of the EPS bearer context.

If the UE requests the release of bearer resources, the ESM cause value typically indicates one of the following:

#36: regular deactivation.

To perform C2 pairing authorization of UAV operation for the C2 communication when a PDN connection is already established for the USS communication, the UE shall include the protocol configuration options IE or the extended protocol configuration options IE as defined in 3GPP TS 24.008 [13] in the BEARER RESOURCE MODIFICATION REQUEST message containing the C2 aviation container. In the C2 aviation container the UE:

- shall include CAA-level UAV ID of the UE;

- shall include the identification information of UAV-C to pair if available; and

- may include the flight authorization information.

NOTE: The CAA-Level UAV ID, pairing information and flight authorization information are coded as described in 3GPP TS 24.501 [54].

Upon receipt the MODIFY EPS BEARER CONTEXT REQUEST message containing the extended protocol configuration options IE containing the C2 aviation container IE, where the C2 aviation container IE:

- shall contain C2 pairing authorization result;

- may contain C2 session security information;

- may contain a new CAA-level UAV ID; and

- may contain the flight authorization information,

if the C2 aviation container IE contains the new CAA-level UAV ID, the UE supporting UAS services, shall replace the CAA-level UAV ID with the new CAA-level UAV ID.



Figure 6.5.4.2.1: UE requested bearer resource modification procedure

For the NBIFOM procedures as defined in 3GPP TS 24.161 [36], the UE may send a BEARER RESOURCE MODIFICATION REQUEST message to the MME.

It is possible that the traffic flow aggregate IE is not needed in the following procedures:

- re-negotiation of header compression configuration associated to an EPS bearer context;

- indicating a change of 3GPP PS data off UE status associated to a PDN connection; or

- NBIFOM procedures.

If the traffic flow aggregate IE is not needed, the UE shall set:

- the length indicator of the Traffic flow aggregate IE to the value 1;

- the TFT operation code to "000";

- the E bit to zero; and

- the number of packet filters to zero.

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#### 6.5.4.3 UE requested bearer resource modification procedure accepted by the network

Upon receipt of the BEARER RESOURCE MODIFICATION REQUEST message, the MME checks whether the resources requested by the UE can be established, modified or released by verifying the EPS bearer identity given in the EPS bearer identity for packet filter IE.

If the bearer resource modification requested is accepted by the network, the MME shall initiate either a dedicated EPS bearer context activation procedure, an EPS bearer context modification procedure or an EPS bearer context deactivation procedure.

If the request to re-negotiate header compression configuration associated to an EPS bearer context is accepted by the network, the MME shall initiate an EPS bearer context modification procedure.

If the bearer resource modification requests a release of bearer resources that results in the TFT of the EPS bearer context containing only packet filters applicable to the uplink direction, the network may initiate the EPS bearer context deactivation procedure.

If the network accepts the UE requested bearer resource modification for C2 communication, the MME shall include the C2 aviation container IE in the extended protocol configuration options IE of the MODIFY EPS BEARER CONTEXT REQUEST message.

Upon receipt of an ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST, MODIFY EPS BEARER CONTEXT REQUEST or DEACTIVATE EPS BEARER CONTEXT REQUEST message with a PTI which matches the value used for the BEARER RESOURCE MODIFICATION REQUEST message, the UE shall stop timer T3481 and enter the state PROCEDURE TRANSACTION INACTIVE. The UE should ensure that the procedure transaction identity (PTI) assigned to this procedure is not released immediately. The way to achieve this is implementation dependent. While the PTI value is not released, the UE regards any received ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST or MODIFY EPS BEARER CONTEXT REQUEST or DEACTIVATE EPS BEARER CONTEXT REQUEST message with the same PTI value as a network retransmission (see clause 7.3.1).

i) If the ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST message is received, the UE shall verify that the EPS bearer identity given in the EPS bearer identity IE is not already used by any EPS bearer context. The UE shall then proceed as described in clause 6.4.2.3 or clause 6.4.2.4.

ii) If the MODIFY EPS BEARER CONTEXT REQUEST message is received, the UE verifies that the EPS bearer identity given in the EPS bearer identity IE is any of the active EPS bearer contexts. The UE shall then proceed as described in clause 6.4.3.3 or clause 6.4.3.4.

iii) If the DEACTIVATE EPS BEARER CONTEXT REQUEST message is received, the UE verifies that the EPS bearer identity given in the EPS bearer identity IE is one of the active EPS bearer contexts. The UE shall then proceed as described in clause 6.4.4.3.

In case i, after successful completion of the dedicated EPS bearer context activation procedure, the network may initiate an EPS bearer context modification procedure to delete the packet filters which have packet filter identifiers indicated by the UE in the Traffic flow aggregate IE in the BEARER RESOURCE MODIFICATION REQUEST message and for which the network created new packet filters during the dedicated EPS bearer context activation procedure. In this case the MME shall set the procedure transaction identity value in the MODIFY EPS BEARER CONTEXT REQUEST message to "no procedure transaction identity assigned".

--------------------------------------- End of Change -------------------------------------