**3GPP TSG-CT WG1 Meeting #132-eC1-215693**

**E-meeting, 11-15 October 2021**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **24.501** | **CR** | **3612** | **rev** | **-** | **Current version:** | **17.4.1** |  |
|  |
| *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:***  | Optimization of the multicast session release procedure |
|  |  |
| ***Source to WG:*** | Qualcomm Incorporated |
| ***Source to TSG:*** | C1 |
|  |  |
| ***Work item code:*** | 5MBS |  | ***Date:*** | 2021-09-22 |
|  |  |  |  |  |
| ***Category:*** | **C** |  | ***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)* |
|  |  |
| ***Reason for change:*** | When the network releases PDU session associated with MBS sessions, the associated MBS sessions are also released. When the MBS sessions are released using PDU session modification procedure, the network provides MBS Received container IE when it wants to provide additional information to the UE. To ensure a consistent 5MBS procedure execution and a consistent UE behavior, it should be possible to provide the same information to the UE when MBS sessions are released using PDU session release procedure.  |
|  |  |
| ***Summary of change:*** | Add optional Received MBS container IE in the PDU SESSION RELEASE COMMAND message. |
|  |  |
| ***Consequences if not approved:*** | Inconsistent procedure execution leading to unexpected UE behavior. |
|  |  |
| ***Clauses affected:*** | 6.3.3.2, 8.3.12.x (new), 8.3.14.1, 8.3.14.x (new), 9.11.4.31  |
|  |  |
|  | **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 \*\*\*

#### 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.

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 and shall not include the Access type IE in the PDU SESSION RELEASE COMMAND.

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:

a) the UE has moved between a tracking area in NB-N1 mode and a tracking area in WB-N1 mode;

b) the UE has moved between a tracking area in NB-S1 mode and a tracking area in WB-N1 mode;

c) the UE has moved between a tracking area in WB-S1 mode and a tracking area in NB-N1 mode; or

d) a PDU session is not only for control plane CIoT 5GS optimization any more,

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

The SMF may initiate the network-requested PDU session release procedure to remove the UE from all MBS sessions associated with the PDU session and to release the PDU session. In that case, the SMF should include the Received MBS container IE in the PDU SESSION RELEASE COMMAND message shall set the MBS Decision to "Remove UE from MBS session" and the appropriate Rejection cause for each respective MBS session.

NOTE 1: The SMF initiates the network-requested PDU session release procedure to remove the UE from all MBS sessions associated with the PDU session and to release the PDU session if SMF is able to decide that the PDU session is not needed for any other purposes.

If the SMF receives UE presence in LADN service area from the AMF indicating 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 should include a Back-off timer value IE in the PDU SESSION RELEASE COMMAND message when the 5GSM cause value #29 "user authentication or authorization failed" is included in the PDU SESSION RELEASE COMMAND message.

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 included

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 \*\*\*

###

### 8.3.14 PDU session release command

#### 8.3.14.1 Message definition

The PDU SESSION RELEASE COMMAND message is sent by the SMF to the UE to indicate a release of a PDU session. See table 8.3.14.1.1.

Message type: PDU SESSION RELEASE COMMAND

Significance: dual

Direction: network to UE

Table 8.3.14.1.1: PDU SESSION RELEASE COMMAND message content

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| IEI | Information Element | Type/Reference | Presence | Format | Length |
|  | Extended protocol discriminator | Extended protocol discriminator9.2 | M | V | 1 |
|  | PDU session ID | PDU session identity9.4 | M | V | 1 |
|  | PTI | Procedure transaction identity9.6 | M | V | 1 |
|  | PDU SESSION RELEASE COMMAND message identity | Message type9.7 | M | V | 1 |
|  | 5GSM cause | 5GSM cause9.11.4.2 | M | V | 1 |
| 37 | Back-off timer value | GPRS timer 39.11.2.5 | O | TLV | 3 |
| 78 | EAP message | EAP message9.11.2.2 | O | TLV-E | 7-1503 |
| 61 | 5GSM congestion re-attempt indicator | 5GSM congestion re-attempt indicator9.11.4.21 | O | TLV | 3 |
| 7B | Extended protocol configuration options | Extended protocol configuration options9.11.4.6 | O | TLV-E | 4-65538 |
| D- | Access type | Access type9.11.2.1A | O | TV | 1 |
| xx | Received MBS container | Received MBS container9.11.4.31 | O | TLV | TBD |

\*\*\* next change \*\*\*

#### 8.3.14.X Received MBS container

This IE is included if the network wants to remove the UE from all MBS sessions associated with the PDU session indicated in the PDU session ID IE.

#### 9.11.4.31 Received MBS container

The purpose of the Received MBS container information element is to indicate to the UE the information of the MBS sessions that the network accepts or rejects the UE to join, or the information of the MBS sessions that the UE is removed from.

The Received MBS container information element is coded as shown in figure 9.11.4.31.1, figure 9.11.4.31.2, figure 9.11.4.31.3, figure 9.11.4.31.4, figure 9.11.4.31.5, figure 9.11.4.31.6, figure 9.11.4.31.7 and table 9.11.4.31.1.

The Received MBS container is a type 4 information element with a minimum length of 6 octets and a maximum length of n octets.

Editor's note: The maximum number of Received MBS informations is FFS and is currently assumed to be 4.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Received MBS container IEI | octet 1 |
| Length of Received MBS container contents | octet 2 |
| Received MBS information 1 | octet 3octet i |
| Received MBS information 2 | octet i+1\*octet l\* |
| … | octet l+1\*octet m\* |
| Received MBS information p | octet m+1\*octet n\* |

Figure 9.11.4.31.1: Received MBS container information element

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Rejection cause | MSAI | IPAE | MD | octet 3 |
| TMGI | octet 4octet j |
| Source IP address information | octet j+1\*octet v\* |
| Destination IP address information | Octet v+1\*Octet k\* |
| MBS service area | Octet k+1\*Octet i\* |

Figure 9.11.4.31.2: Received MBS information

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| MBS TAI list  | Octet k+1\*Octet i\* |

Figure 9.11.4.31.3: MBS service area for MBS service area indication = "MBS service area included as MBS TAI list"

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| NR CGI list | Octet k+1\*Octet i\* |

Figure 9.11.4.31.4: MBS service area for MBS service area indication = "MBS service area included as NR CGI list"

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| MBS TAI list  | Octet k+1\*Octet y\* |
| NR CGI list | Octet y+1\*Octet i\* |

Figure 9.11.4.31.5: MBS service area for MBS service area indication = "MBS service area included as MBS TAI list and NR CGI list"

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| NR CGI 1 | Octet k+1\*Octet k+8\* |
| NR CGI 2 | Octet k+8\*Octet k+15\* |
| … | Octet k+16\*Octet c\* |
| NR CGI w | Octet c+1\*Octet i\* |

Figure 9.11.6.BB.6: NR CGI list

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| NR Cell ID | Octet k+1\* |
| Octet k+5\* |
| MCC digit 2  | MCC digit 1 | Octet k+6\* |
| MNC digit 3 | MCC digit 3 | Octet k+7\* |
| MNC digit 2 | MNC digit 1 | Octet k+8\* |

Figure 9.11.7.BB.7: NR CGI

\*\*\* next change \*\*\*

**Table 9.11.4.31.1: Received MBS container information element**

|  |
| --- |
| MBS decision (MD) (bits 1 and 2 of octet 3)  |
| The MD indicates the network decision of the join requested by the UE or if the network requests to remove the UE from the MBS session. |
| Bits |
| **2** | **1** |  |  |
| 0 | 1 |  | MBS join is accepted |
| 1 | 0 |  | MBS join is rejected |
| 1 | 1 |  | Remove UE from MBS session |
| All other values are reserved. |
|  |
| If MD is set to "MBS join is rejected" or "Remove UE from MBS session", bits 5 to 8 of octet 3 shall contain the Rejection cause, otherwise bits 5 to 8 of octet 3 are spare and shall be coded as zero. |
|  |
| IP address existence (IPAE) (bit 3 of octet 3) |
| The IPAE indicates whether the Source IP address information and Destination IP address information are included in the IE or not. |
| Bit |
| **3** |  |  |
| 0 |  | Source and destination IP address information not included |
| 1 |  | Source and destination IP address information included |
|  |
| Also If IPAE is set to "Source and destination IP address information included", Source IP address information and Destination IP address information shall be included in the IE, otherwise Source IP address information and Destination IP address information shall not be included in the IE. |
|  |
| MBS service area indication (MSAI) (bits 4 and 5 of octet 3) |
| The MSAI indicates whether the MBS service area is included in the IE or not |
| Bits |
| **5** | **4** |  |  |
| 0 | 0 |  | MBS service area not included |
| 0 | 1 |  | MBS service area included as MBS TAI list |
| 1 | 0 |  | MBS service area included as NR CGI list |
| 1 | 1 |  | MBS service area included as MBS TAI list and NR CGI list |
|  |
| Rejection cause (bits 6 to 8 of octet 3) |
| The Rejection cause indicates the reason for rejecting the join request or for removing the UE from MBS session. |
| Bits |
| **8** | **7** | **6** |  |  |
| 0 | 0 | 0 |  | No additional information provided |
| 0 | 0 | 1 |  | Insufficient resources |
| 0 | 1 | 0 |  | User is not authorized to use MBS service  |
| 0 | 1 | 1 |  | MBS session has not started or will not start soon |
| 1 | 0 | 0 |  | User is outside of local MBS service area |
| 1 | 0 | 1 |  | Session context not found |
| All other values are unused in this version of the specification and interpreted as 000 if received. |
|  |
| TMGI (octets 4 to j) |
| The TMGI is coded as described in subclause 10.5.6.13 in 3GPP TS 24.008 [12] starting from octet 2. |
|  |
| Source IP address information (octet j+1 to v) |
| This field contains the IP unicast address used as source address in IP packets for identifying the source of the multicast service. |
|  |
| The Source IP address information is coded as the PDU address described in subclause 9.11.4.10 starting from octet 3 in figure 9.11.4.10.1 and table 9.11.4.10.1. |
|  |
| Destination IP address information (octet v+1 to k) |
| This field contains the IP multicast address used as destination address in related IP packets for identifying a multicast service associated with the source. |
|  |
| The Destination IP address information is coded as the PDU address described in subclause 9.11.4.10 starting from octet 3 in figure 9.11.4.10.1 and table 9.11.4.10.1. |
|  |
| MBS service area (octet k+1 to i) |
| The MBS service area contains either the MBS TAI list or the NR CGI list, that identify the service area(s) for a local MBS service. |
|  |
| MBS TAI list (octet k+1 to i) |
| The MBS TAI list is coded as the 5GS tracking area identity list defined in subclause 9.11.3.9. |
|  |
| NR CGI (octet k+1 to i) |
| The NR CGI globally identifies an NR cell. It contains the NR Cell ID and the PLMN ID of that cell. |
|  |
| NR Cell ID (octet k+1 to k+5) |
| The NR Cell ID consists of 36 bits identifying an NR Cell ID as specified in subclause 9.3.1.7 of 3GPP TS 38.413 [31], in hexadecimal representation. Bit 8 of octet y+1 is the most significant bit and bit 5 of octet y+5 is the least significant bit. Bits 1 to 4 of octet y+5 are spare and shall be coded as zero. |
|  |

\*\*\* no more changes \*\*\*