**3GPP TSG-CT WG1 Meeting #136-eC1-22abcd**

**E-Meeting, 12th – 20th May 2022 (was C1-223440)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **24.501** | **CR** | **4270** | **rev** | **1** | **Current version:** | **17.6.1** |  |
|  | | | | | | | | |
| *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:*** | Maximum number of associated MBS sessions | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson, Nokia, Nokia Shanghai Bell | | | | | | | | | |
| ***Source to TSG:*** | C1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5MBS | | | | |  | ***Date:*** | | | 2022-05-04 |
|  |  | | | |  | |  | | |  |
| ***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 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)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | A response to the CT1 LS (C1-216247), in which SA2 is asked about the maximum number of associated PDU sessions, has been received in C1-223331 (S2-2203050).  It is proposed keep current definition of NAS MBS containers allowing a variable number of MBS session information/Received MBS information.  The related Editor’s Notes are proposed to be deleted. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Related Editor’s notes are deleted | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Remaining Editor’s Notes | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 9.11.4.30, 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 \* \* \* \*

#### 9.11.4.30 Requested MBS container

The purpose of the Requested MBS container information element is for UE to request to join or leave one or more MBS sessions.

The Requested MBS container information element is coded as shown in figure 9.11.4.30.1, figure 9.11.4.30.2, figure 9.11.4.30.3, figure 9.11.4.30.4 and table 9.11.4.30.1.

The Requested MBS container is a type 6 information element with a minimum length of 8 octets and a maximum length of 65538 octets.

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

Figure 9.11.4.30.1: Requested MBS container information element

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | | 6 | 5 | | 4 | | | 3 | 2 | | 1 |  |
| 0 | 0 | 0 | | | 0 | | MBS operation | | | | Type of MBS session ID | | octet 4 |
| spare | | | | | | | |  | | |  |
| MBS session ID | | | | | | | | | | | | | octet 5  octet i |

Figure 9.11.4.30.2: MBS session information

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| TMGI | | | | | | | | octet 5 |
| octet i |

Figure 9.11.4.30.3: MBS session ID for Type of MBS session ID = "Temporary Mobile Group Identity (TMGI)"

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Source IP address information | | | | | | | | octet 5  octet v |
| Destination IP address information | | | | | | | | Octet v+1  Octet i |

Figure 9.11.4.30.4: MBS session ID for Type of MBS session ID = "Source specific IP multicast address for IPv4" or "Source specific IP multicast address for IPv6"

**Table 9.11.4.30.1: Requested MBS container information element**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Type of MBS session ID (bits 1 to 2 of octet 4) | | | | | |
| Bits | | | | | |
| **2** | | **1** |  |  | |
| 0 | | 1 |  | Temporary Mobile Group Identity (TMGI) | |
| 1 | | 0 |  | Source specific IP multicast address for IPv4 | |
| 1 | | 1 |  | Source specific IP multicast address for IPv6 | |
| All other values are reserved. | | | | | |
|  | | | | | |
| MBS operation (bits 3 to 4 of octet 4) | | | | | |
| Bits | | | | | |
| **4** | **3** | |  | |  |
| 0 | 1 | |  | | Join MBS session |
| 1 | 0 | |  | | Leave MBS session |
| All other values are reserved. | | | | | |
|  | | | | | |
| Bits 5 to 8 of octet 4 are spare and shall be coded as zero. | | | | | |
|  | | | | | |
| If Type of MBS session ID is set to "Temporary Mobile Group Identity (TMGI)", the MBS session ID contains the TMGI (octet 5 to i) and is coded as described in subclause 10.5.6.13 in 3GPP TS 24.008 [12] starting from octet 2. | | | | | |
|  | | | | | |
| If Type of MBS session ID is set to "Source specific IP multicast address for IPv4" or " Source specific IP multicast address for IPv6", the MBS session ID contains the Source IP address information and the Destination IP address information. | | | | | |
|  | | | | | |
| Source IP address information (octet 5 to v) | | | | | |
| This field contains the IP unicast address used as source address in IP packets for identifying the source of the multicast service. | | | | | |
|  | | | | | |
| If the type of MBS session ID indicates "Source specific IP multicast address for IPv4", the Source IP address information in octet 5 to octet 8 contains an IPv4 address. If the type of MBS session ID indicates "Source specific IP multicast address for IPv6", the Source IP address information in octet 5 to octet 20 contains an IPv6 address. | | | | | |
|  | | | | | |
| Destination IP address information (octet v+1 to i) | | | | | |
| This field contains the IP multicast address used as destination address in related IP packets for identifying a multicast service associated with the source. | | | | | |
|  | | | | | |
| If the type of MBS session ID indicates "Source specific IP multicast address for IPv4", the Destination IP address information in octet v+1 to octet v+4 contains an IPv4 address. If the type of MBS session ID indicates "Source specific IP multicast address for IPv6", the Source IP address information in octet v+1 to octet v+16 contains an IPv6 address. | | | | | |
|  | | | | | |

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

#### 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, the information of the MBS sessions that the UE is removed from, or the information of the updated MBS service area.

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, figure 9.11.4.31.8, figure 9.11.4.31.9, figure 9.11.4.31.10 and table 9.11.4.31.1.

The Received MBS container is a type 6 information element with a minimum length of 9 octets and a maximum length of 65538 octets.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Received MBS container IEI | | | | | | | | octet 1 |
| Length of Received MBS container contents | | | | | | | | octet 2  octet 3 |
| Received MBS information 1 | | | | | | | | octet 4  octet 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 | | | MD | | | | | octet 4 | |
| 0 | | 0 | | 0 | 0 | | MSCI | MTI | | | | IPAE | octet 5 | |
| spare | | | | | | |  |  | |
| TMGI | | | | | | | | | | | | | octet 6  octet 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 s\* | |
| MBS timers | | | | | | | | | | | | | octet s+1\*  octet i\* | |
| MBS security container | | | | | | | | | | | | | octet i+1\*  octet e\* | |

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 |  |
| Length of NR CGI list contents | | | | | | | | octet k+1\* |
| NR CGI 1 | | | | | | | | octet k+2\*  octet k+9\* |
| NR CGI 2 | | | | | | | | octet k+10\*  octet k+17\* |
| … | | | | | | | | octet k+18\*  octet c\* |
| NR CGI w | | | | | | | | octet c+1\*  octet s\* |

Figure 9.11.4.31.6: 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 9.11.4.31.7: NR CGI

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  | |
| MBS start time | | | | | | | | | octet s+1\*  octet s+6\* | |

Figure 9.11.4.31.8: MBS timers for MBS timer indication = "MBS start time"

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  | |
| MBS back-off timer | | | | | | | | | octet s+1\* | |

Figure 9.11.4.31.9: MBS timers for MBS timer indication = "MBS back-off timer"

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| MSK ID | | | | | | | | octet i+1\*  octet i+4\* |
| MSK | | | | | | | | octet i+5\*  octet i+20\* |
| MTK ID | | | | | | | | octet i+21\*  octet i+22\* |
| Encrypted MTK | | | | | | | | octet i+23\*  octet i+38\* |

Figure 9.11.4.31.12: MBS security container

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

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| MBS decision (MD) (bits 1 oto 3 of octet 4) | | | | | | | | | |
| The MD indicates the network decision of the join requested by the UE, the network requests to remove the UE from the MBS session or the network request to update the MBS service area of MBS session. | | | | | | | | | |
| Bits | | | | | | | | | |
| **3** | | **2** | | | **1** | | |  | |
| 0 | | 0 | | | 1 | | | MBS service area update | |
| 0 | | 1 | | | 0 | | | MBS join is accepted | |
| 0 | | 1 | | | 1 | | | MBS join is rejected | |
| 1 | | 0 | | | 0 | | | Remove UE from MBS session | |
| All other values are unused in this version of the specification and interpreted as 000 if received. | | | | | | | | | |
|  | | | | | | | | | |
| If MD is set to "MBS join is rejected" or “Remove UE from MBS session”, bits 6 to 8 of octet 4 shall contain the Rejection cause which indicates the reason of rejecting the MBS join request or the reason of removing the UE from MBS session, respectively, otherwise bits 6 to 8 of octet 4 are spare and shall be coded as zero. | | | | | | | | | |
|  | | | | | | | | | |
| MBS service area indication (MSAI) (bits 4 and 5 of octet 4) | | | | | | | | | |
| The MSAI indicates whether the MBS service area is included in the IE or not. | | | | | | | | | |
| Bits | | | | | | | | | |
| **5** | | **5** | | | **5** | | | **5** | |
| 0 | | 0 | | | 0 | | | 0 | |
| 0 | | 0 | | | 0 | | | 0 | |
| 1 | | 1 | | | 1 | | | 1 | |
| 1 | | 1 | | | 1 | | | 1 | |
|  | | | | | | | | | |
| Rejection cause (bits 6 to 8 of octet 4) | | | | | | | | | |
| The Rejection cause indicates the reason of rejecting the join request or the reason of removing the UE from the 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 |
| 1 | | | 1 | 0 | | |  | | MBS session is released |
| All other values are unused in this version of the specification and interpreted as 000 if received. | | | | | | | | | |
|  | | | | | | | | | |
| IP address existence (IPAE) (bit1 of octet 5) | | | | | | | | | |
| The IPAE indicates whether the Source IP address information and Destination IP address information are included in the IE or not. | | | | | | | | | |
| Bit | | | | | | | | | |
| **1** |  | | | | |  | | | |
| 0 |  | | | | | Source and destination IP address information not included | | | |
| 1 |  | | | | | Source and destination IP address information included | | | |
|  | | | | | | | | | |
| 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 timer indication (MTI) (bits 2 and 3 of octet 5) | | | | | | | | | |
| The MTI indicates whether there is MBS timer included in the IE or not. | | | | | | | | | |
| Bit | | | | | | | | | |
| **3** | **2** | | | | |  | | | |
| 0 | 0 | | | | | No MBS timers included | | | |
| 0 | 1 | | | | | MBS start time included | | | |
| 1 | 0 | | | | | MBS back-off timer included | | | |
| All other values are unused in this version of the specification and interpreted as 00 if received | | | | | | | | | |
|  | | | | | | | | | |
| MBS security container indication (MSCI) (bit 4 of octet 5) | | | | | | | | | |
| The MSCI indicates whether the MBS security container is included in the IE or not | | | | | | | | | |
| Bit | | | | | | | | | |
| **4** | | | | | | | | | |
| 0 | MBS security container not included | | | | | | | | |
| 1 | MBS security container included | | | | | | | | |
|  | | | | | | | | | |
| TMGI (octets 6 to j) | | | | | | | | | |
| The TMGI is coded as described in subclause 10.5.6.13 in 3GPP TS 24.008 [12] starting from octet 2. | | | | | | | | | |
|  | | | | | | | | | |
| Bits 5 to 8 of octet 5 are spare and shall be coded as zero. | | | | | | | | | |
|  | | | | | | | | | |
| 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 value of this field is copied from the corresponding source IP address information in the requested MBS container. | | | | | | | | | |
|  | | | | | | | | | |
| 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 value of this field is copied from the corresponding destination IP address information in the requested MBS container. | | | | | | | | | |
|  | | | | | | | | | |
| MBS service area (octet k+1 to s) | | | | | | | | | |
| The MBS service area contains the MBS TAI list, the NR CGI list or both, that identifies the service area(s) for a local MBS service. | | | | | | | | | |
|  | | | | | | | | | |
| MBS TAI list (octet k+1 to s) | | | | | | | | | |
| The MBS TAI list is coded as octet 2 and above of the 5GS tracking area identity list IE defined in subclause 9.11.3.9. | | | | | | | | | |
|  | | | | | | | | | |
| NR CGI (octet k+2 to k+9) | | | | | | | | | |
| 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+2 to k+6) | | | | | | | | | |
| 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. | | | | | | | | | |
| MCC, Mobile country code (octet k+6 and bits 1 to 4 octet k+7)  The MCC field is coded as in ITU-T Recommendation E.212 [42], annex A. | | | | | | | | | |
|  | | | | | | | | | |
| MNC, Mobile network code (bits 5 to 8 of octet k+7 and octet k+8)  The coding of this field is the responsibility of each administration but BCD coding shall be used. The MNC shall consist of 2 or 3 digits. If a network operator decides to use only two digits in the MNC, bits 5 to 8 of octet k+7 shall be coded as "1111". | | | | | | | | | |
|  | | | | | | | | | |
| The contents of the MCC and MNC digits are coded as octets 6 to 8 of the Temporary mobile group identity IE in figure 10.5.154 of 3GPP TS 24.008 [12]. | | | | | | | | | |
|  | | | | | | | | | |
| MBS start time (octets s+1 to s+6) | | | | | | | | | |
| The MBS start time is coded as described in subclause 10.5.3.9 in 3GPP TS 24.008 [12] starting from octet 2 till octet 7. | | | | | | | | | |
|  | | | | | | | | | |
| MBS back-off timer (octet s+1) | | | | | | | | | |
| The MBS back-off timer is coded as octet 3 described in subclause 10.5.7.4a in 3GPP TS 24.008 [12]. | | | | | | | | | |
|  | | | | | | | | | |
| MBS Service Key Identifier (MSK ID) (octets i+1 to i+4) | | | | | | | | | |
| The MSK ID is 4 bytes long and is defined in 3GPP TS 33.246 [57]. | | | | | | | | | |
|  | | | | | | | | | |
| MBS Service Key (MSK) (octets i+5 to i+20) | | | | | | | | | |
| The MSK is 16 bytes long and is defined in 3GPP TS 33.246 [57]. | | | | | | | | | |
|  | | | | | | | | | |
| MBS Traffic Key Identifier (MTK ID) (octets i+21 to i+22) | | | | | | | | | |
| The MTK ID is 2 bytes long and is defined in 3GPP TS 33.246 [57]. | | | | | | | | | |
|  | | | | | | | | | |
| Encrypted MBS Traffic Key (Encrypted MTK) (octets i+23 to i+38) | | | | | | | | | |
| The Encrypted MTK is 16 bytes long and contains the encrypted version of MTK using MSK as defined in 3GPP TS 33.246 [57]. | | | | | | | | | |
|  | | | | | | | | | |
| NOTE: The IPAE bit is not expected to be set to "Source and destination IP address information included" when the MBS decision (MD) indicates "Remove UE from MBS session". | | | | | | | | | |

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